user guide

hp StorageWorks library and tape tools

Product Version: 3.2

Fourth Edition (May 2003)

Part Number: 5969-5745

HP StorageWorks Library and Tape Tools (L&TT) is a comprehensive application that provides functions for identifying, testing, updating, and troubleshooting a wide variety of data storage hardware and media.

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HP StorageWorks Library and Tape Tools User Guide
Fourth Edition (May 2003)
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about this guide

About This Guide

This user guide provides information to help you:

- Understand features and functionality of L&TT
- Effectively use the full functionality of L&TT to obtain maximum performance from your storage hardware, and to test, diagnose, and resolve hardware issues

About this Guide topics include:

- Overview
- Conventions
- Getting Help

Overview

This section covers the following topics:

- Intended Audience
- Prerequisites

Intended Audience

This book is intended for use by:

- Users who want to use L&TT to conveniently update firmware in their storage hardware
- Users who need to test, diagnose, and resolve storage hardware issues

Prerequisites

Before you attempt to use L&TT, you should have a basic understanding of the following technologies:

- Storage hardware functionality and operation
- SCSI operation

Conventions

Conventions consist of the following:

- Document Conventions
- Text Symbols

Document Conventions

The document conventions included in Table 1 apply in most cases.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Figure 1
Key and field names, screen names, menu items, buttons, and dialog box titles	**Bold**
File names, application names, and text emphasis	*Italics*
User input, command names, directory names, and system responses (output and messages)	`Monospace font`
Variables	*`<monospace, italic font enclosed in angle brackets>`*
Website addresses	Underlined sans serif font text: http://www.hp.com

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: http://www.hp.com.

HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: http://www.hp.com/support/. From this website, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: http://www.hp.com.

Introduction

1

HP StorageWorks Library and Tape Tools (L&TT) is a collection of storage hardware management and diagnostic tools for Nearline Tape, Nearline Tape Automation, and Nearline Archival products. L&TT assembles these tools into a single, convenient program.

Software Features

L&TT offers the following features:

- **Installation Check**—L&TT guides you through a basic installation check of your product. The software assists the user in choosing an appropriate HBA and SCSI ID(s), ensuring that the device is detected by the system, and verifying key device functionality. The installation check feature is essentially HTML documentation that helps with the most common generic installation issues while also describing how to use L&TT to verify the device installation.
- **Device Identification**—L&TT clearly identifies the storage products connected to the system, along with key information on product configuration and status.
- **Troubleshooting Tests**—L&TT provides various tests to verify product functionality or to isolate product issues. Tests include device self-tests, read/write tests on drives, exerciser tests for autoloaders and libraries, and specific device utilities.
- **Firmware Upgrades**—L&TT provides a convenient way of updating product firmware, enabling users with an Internet connection to take advantage of ongoing enhancements. The software can be configured to check the Web automatically for firmware updates for connected devices, or users can manually check the Web for updates if the automatic update feature is not desired. If updated firmware is available, the program notifies the user, and the updates can easily be copied to the system. With libraries, users can

upgrade the library and the embedded drive firmware in the same operation. Wherever possible, the embedded drives are updated in parallel to reduce time.

- **Support Ticket Generation**—If you experience a problem with a storage product, L&TT can generate a support ticket that includes essential information for troubleshooting the problem. As an alternative to phone support, you can e-mail the support ticket to a support center for assistance. This information streamlines the support process and enables the support staff to better serve you if a support call is made later.

  When a support ticket for a device is generated, L&TT performs a Device Analysis test on the device. The support ticket contains generic information about a device, as well as the results of the Device Analysis test. The Device Analysis test can be performed by itself, but HP recommends generating a support ticket because the resulting data is presented in a more useful format.

- **Automatic Notification of Web Updates**—If a connection to the Internet is present and web updates are enabled in the tool preferences, L&TT automatically informs you of the following updates, if available, each time the program is started:

  — New versions of L&TT

  — New firmware files for connected devices

  — New device-specific functionality (such as new or updated tests) for connected devices

Supported Products and Operating Systems

For a complete listing of compatible products, refer to the L&TT Compatibility Matrix found at http://www.hp.com/support/lttcompatibility.

The level of functionality that L&TT offers for each device varies depending on features of the device, and the degree of device integration into L&TT.

Finding Additional Information

The HP website provides the current version of L&TT for download, and general information about the tool. Access the website at:

http://www.hp.com/support/tapetools

Getting Support

E-mail support is available from ltt_team@hp.com. You can expect a response within 24 hours (usually sooner) during a normal business week.

Use this address to obtain support for L&TT, to report bugs, to provide feedback on this manual, to report any issues with the L&TT website, or to provide enhancement suggestions. HP appreciates feedback on how to make improvements for future versions of L&TT.

Note: This address is intended to provide support for L&TT software. This address is NOT for assistance in troubleshooting hardware products. Refer to the documentation that comes with your hardware for support options for that product.

Installation

2

This chapter outlines the procedure for installing L&TT on a Microsoft Windows ®, Novell NetWare, HP-UX, HP Tru64, or Linux platform. The Windows version of L&TT uses a graphical user interface (GUI), whereas the NetWare, HP-UX, Tru64, and Linux versions of the program use a command screen interface (CSI).

The information in this chapter and in subsequent chapters is presented for both the GUI and CSI versions of L&TT. When using an electronic version of this documentation, click the appropriate GUI or CSI icon at the beginning of the chapter to quickly jump to the section of documentation that applies to your operating system (OS) or user interface:

Select your OS:

Windows

NetWare

HP-UX, Tru64, and Linux

GUI Installing L&TT for Windows

The Windows version of L&TT uses the InstallShield application. InstallShield lets you choose the installation directory and select other options. It also sets up shortcuts to launch the application in the Start menu and on the desktop. The Start menu shortcuts also provide access to the online help, the readme file, the report viewer, and the uninstaller.

Installation Procedure

To install the Windows version of L&TT:

1. Download or copy the self-extracting executable file to a temporary location.
2. Double-click the self-extracting executable file to launch the installer. The **InstallShield Wizard** screen is displayed.
3. Click **Next**. Read the program license agreement and click **Yes** if you agree to and accept the terms of the license agreement.
4. Read the readme file for any last-minute changes to the documentation, then click **Next**. The **Select Components** screen is displayed.
5. Select the desired components to install and click **Next**.

   In most cases, the default settings of this screen are adequate. Windows NT 4.0, Windows 2000, and Windows XP users have the option to install Advanced SCSI Programming Interface (ASPI) support. With Windows 9*x* installations, the ASPI component is required and automatically included in the L&TT installation process. HP recommends that you not install ASPI support unless you have a good reason to do so. ASPI support is beneficial when installed storage applications cannot be shut down, and those applications have locked access to the device through the Miniport driver. If ASPI is installed, it is generally not necessary to shut down these applications to access devices through L&TT (although the applications should not be accessing the devices while L&TT is running). ASPI lets you run L&TT on a locked device without rebooting; however, a reboot is required after installing ASPI.
6. Select a destination location to install the program. You can accept the default location or click **Browse** to install to a different location. After choosing the destination location, click **Next**.
7. Indicate the program directory in which you want the setup program to create program icons and click **Next**. The program directory is created in the **Programs** directory of the **Start** menu.

8. On the **Ready to start installation process screen**, click **Next**. If you need to review or change installation settings, click **Back**.
9. When installation is complete, click **Finish** to close the InstallShield wizard.

Reboot Criteria

Under some circumstances, the installation process requires a reboot of the system. A reboot is required only in the following situations:

1. If your system requires ASPI or an upgrade to the currently installed version, a reboot is required. On systems that require ASPI, if the installer detects a previously-installed version of ASPI older than v4.57, it will install a more recent version of ASPI requiring a reboot.

   On Windows NT and 2000, ASPI is not installed as part of the operating system. If a reboot is unacceptable, do not select the check box for this option in the installation process. If you choose not to install ASPI, then you must use the Miniport driver (Miniport I/O mode) to scan for devices.

   Problems may arise, however, when using the Miniport I/O mode with devices that use non-standard OS drivers, or are "claimed" by other applications or the OS. When using the Miniport I/O mode when a device is claimed, it may be necessary to shut down any running backup/storage application services to make the device accessible to L&TT. Alternatively, using the ASPI I/O mode may make the device accessible without requiring any further action.
2. If the installation program detects an older version of the *comctl32.dll* installed on the system, then it automatically upgrades this file to the current revision level, and a reboot is required. This file is the Windows Common Control Library, and it is a required component of Windows. If you are running Internet Explorer 4 (with service pack 2) or a later version, then you already have the correct version of the Windows Common Control Library.

CSI Installing L&TT for NetWare

To install the NetWare version of L&TT:

1. Download the L&TT for NetWare file to a temporary directory.
2. From a client workstation, use any standard unzip utility* to extract the file to the *SYS:System* directory on the NetWare server. Make sure that the option to create a directory is enabled in the archiving software.

Note: * The unzip NLM that comes with later versions of NetWare has not been tested and should not be used to unzip the archive.

CSI Installing L&TT for HP-UX, Tru64, and Linux

To install L&TT for HP-UX, Tru64, or Linux:

1. Log in as root.
2. Navigate to the temporary directory:

   ```
   cd /tmp
   ```

3. Download or copy the L&TT tar file, *hp_ltt<xx>.tar* (where <*xx*> is the version number) to this directory. If you are copying the file from a different location, enter the following (substitute the directory in which the file currently resides for <*directory name*>):

   ```
   cp /<directory name>/hp_ltt<xx>.tar /tmp
   ```

4. Untar the L&TT tar file:

   ```
   tar -xvf hp_ltt<xx>.tar
   ```

5. Run the install script in the `/tmp` directory:

   ```
   ./install_hpltt<xx>
   ```

6. After the software is successfully installed, enter the following commands to remove the `/tmp/ltt` directory and its contents:

   ```
   cd /tmp
   rm -rf ltt
   rm -rf install_hpltt
   ```

Basic Operation

3

This chapter describes how to start L&TT and the basic operation of the software. This chapter is divided into two sections: one for using L&TT in a GUI environment (Windows) and one for using L&TT in a CSI environment (NetWare, HP-UX, Tru64, and Linux). To quickly jump to the appropriate section, click one of the following graphics:

Windows

NetWare, HP-UX, Tru64, Linux

GUI Starting L&TT

To start L&TT:

- Double-click the L&TT icon on the desktop (if present)

  - or -

- Click **Start > Programs > HP StorageWorks Library and Tape Tools > HP StorageWorks Library and Tape Tools**

GUI Using the Splash Screen

When L&TT is started, the splash screen is displayed. The splash screen gives you the opportunity to exit the application before any SCSI bus activity has taken place. This feature lets you exit the application if it was started unintentionally. This prevents the program from interfering with any backup or other storage applications that may currently be running.

The splash screen also allows you to select the SCSI I/O mode (if more than one option is available). If you are installing a hardware device, the **Installation Check** feature displays an HTML help screen that provides instruction on common setup and device verification steps.

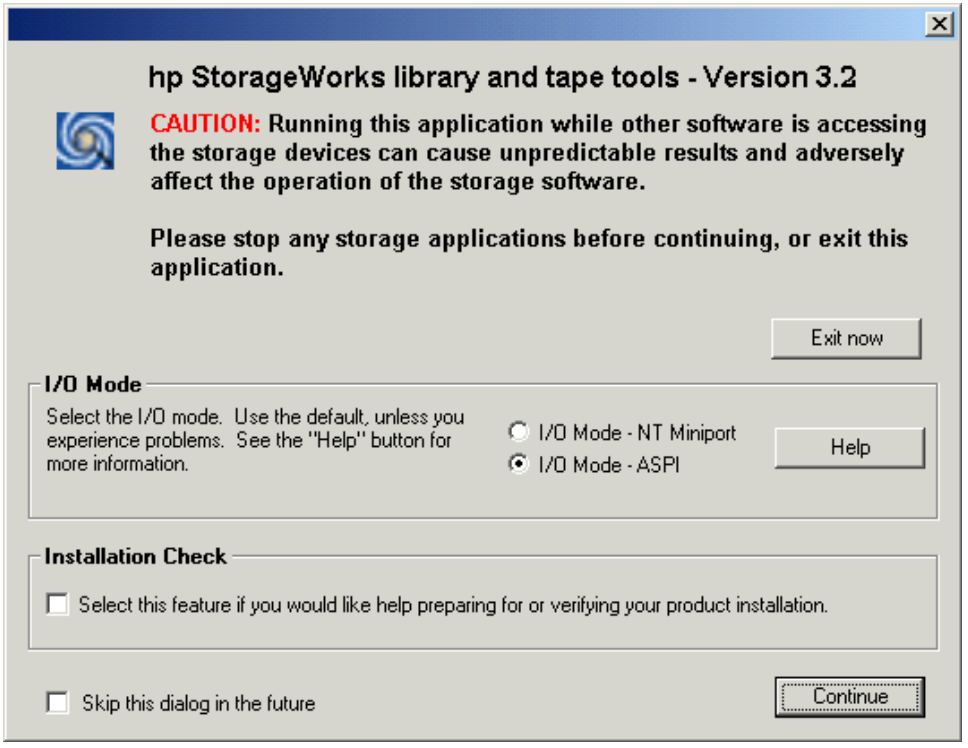
hp StorageWorks library and tape tools - Version 3.2
CAUTION: Running this application while other software is accessing the storage devices can cause unpredictable results and adversely affect the operation of the storage software.
Please stop any storage applications before continuing, or exit this application.
Exit now
I/O Mode
Select the I/O mode. Use the default, unless you experience problems. See the "Help" button for more information.
I/O Mode - NT Miniport
I/O Mode - ASPI
Help
Installation Check
Select this feature if you would like help preparing for or verifying your product installation.
Skip this dialog in the future
Continue

Figure 1: L&TT splash screen

I/O Mode

L&TT selects the input/output (I/O) mode that is most appropriate for the system it is running on. However, this initial screen allows for manual selection of the I/O mode in certain cases. L&TT currently operates in the following two I/O modes:

- **NT Miniport**—uses an interface that is native to Windows NT 4.0, 2000, XP, and .NET. This is the preferred I/O mode on systems where it is available because it does not require the installation of the ASPI interface. However, there are some limitations to the Windows NT Miniport I/O mode related to using devices that are "claimed" by other applications, or that are used with non-standard OS drivers. In those cases, selecting the ASPI I/O mode can make a device accessible.

Note: The Windows NT Miniport I/O mode is not available on Windows 9x.

- **ASPI**—uses an optional I/O programming interface that is available on all versions of Windows. This I/O mode can be used with any Windows operating system. It may require the installation or update of additional OS components, possibly requiring a reboot of the system during installation.

Installation Check

If this check box is selected when you click **Continue**, L&TT opens a browser window displaying an HTML file that provides advice on how to do the following:

- Select an HBA and SCSI target ID for the device
- Verify installation and operation of the device

Skip This Dialog in the Future

If this check box is selected when you click **Continue**, the splash screen is not displayed on subsequent uses of L&TT. The program will continue to use the settings that you selected the last time the splash screen was viewed.

To re-enable the splash screen, select **Preferences** from the **Options** menu. Check the option **Display initial dialogue at Startup to choose I/O mode etc**.

GUI Application Window Layout

After the I/O mode is selected, click **Continue** on the splash screen. The L&TT main screen is displayed. Figure 2 shows the L&TT main screen divided into three sections.

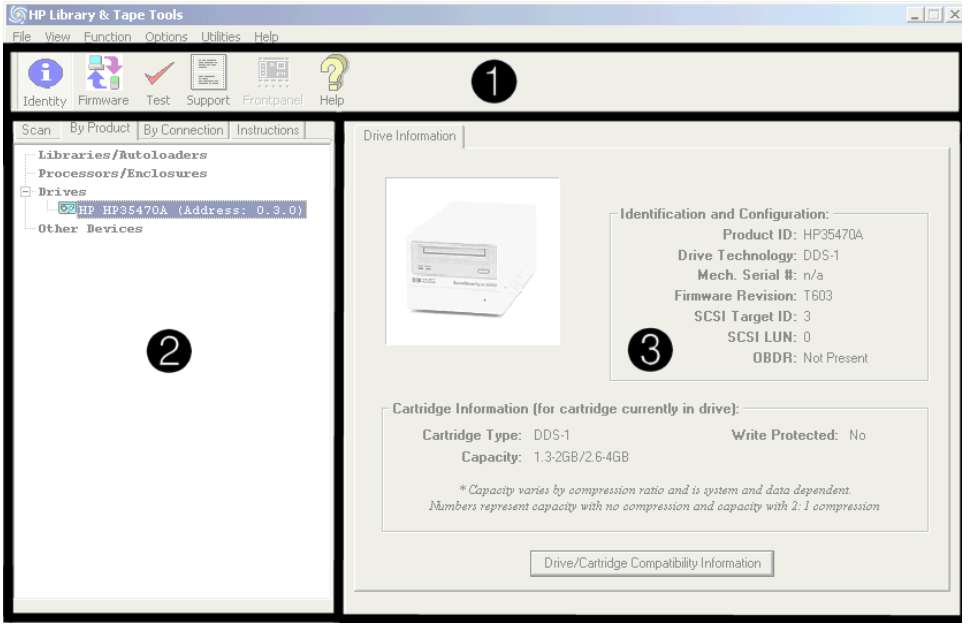

Figure 2: L&TT main screen

The three sections of the L&TT main screen are:

1. **Taskbar**—This section contains buttons that provide quick access to the main functions of L&TT and to the online help system.

Note: Above the Taskbar is the standard Windows menu bar that provides alternate navigation to tool functions, as well as access to a number of other features.

---

2. **Device List**—This is a multi-function window that offers several options on the following tabs:

   - **Scan**—This option provides either a summary status or detailed information (depending on whether **Show Details** or **Hide Details** is selected) about the bus scanning process. If a problem is encountered during the scan, this information may help in determining the cause. When the scan completes successfully, the device list automatically switches to the **By Product** tab.

     The **Scan** tab also lets you rescan the bus. If any devices have been hot-swapped or powered on after the OS has booted, in most cases, the rescan feature can discover those devices without requiring a reboot of the system.

Caution: Swapping SCSI devices, including connecting and disconnecting cables and/or terminators, can cause the system to hang or crash.

Caution: On Windows NT 4.0, 2000, XP, and .NET, changing devices at a specific SCSI address can cause unpredictable behavior. Parts of the operating system may not detect that the device or device type has changed.

   - **By Product**—This option shows a list of all the products connected to the system. The list is grouped into the following four categories:

   — Libraries and autoloaders

   — Drives

   — Enclosures and processors

   — Other devices

     The three number fields listed after the device represent the device address. Each field in the address is separated by a period: the first field represents the HBA channel, the second field represents the SCSI ID, and the third field represents the LUN.

Note: When using the Miniport I/O mode, the HBA channel field is shown as "A/B," where A is the channel and B is the subchannel.

- **By Connection**—This option shows all products connected to the system, grouped by the HBA they are connected to. This view makes it easy to see which devices are connected to the same bus as the device in question, and may help in understanding system I/O performance issues.
- **Instructions**—This window contains brief instructions on how to use the selected screen. This view can be disabled in the software preferences.

3. **Device Information screen—**All the main functions of the program are displayed in this window. The content of this window depends on the device and tool function selected.

GUI Using the Device Information Screen

When you select a product from the **Device List**, the **Device Information** screen displays information relevant to the device. The **Device List** also changes to display instructions on this page (if the instructions preference is enabled). If another tool function is currently active, then clicking the **Identity** button on the toolbar opens the **Device Information** screen.

The **Device Information** screen provides an overview of the selected hardware device and its current configuration and status.

Standalone Devices

The **Device Information** screen, showing a standalone device, contains a single tab labeled **Drive Information**. The **Device Information** screen has four main sections, as shown in Figure 3.

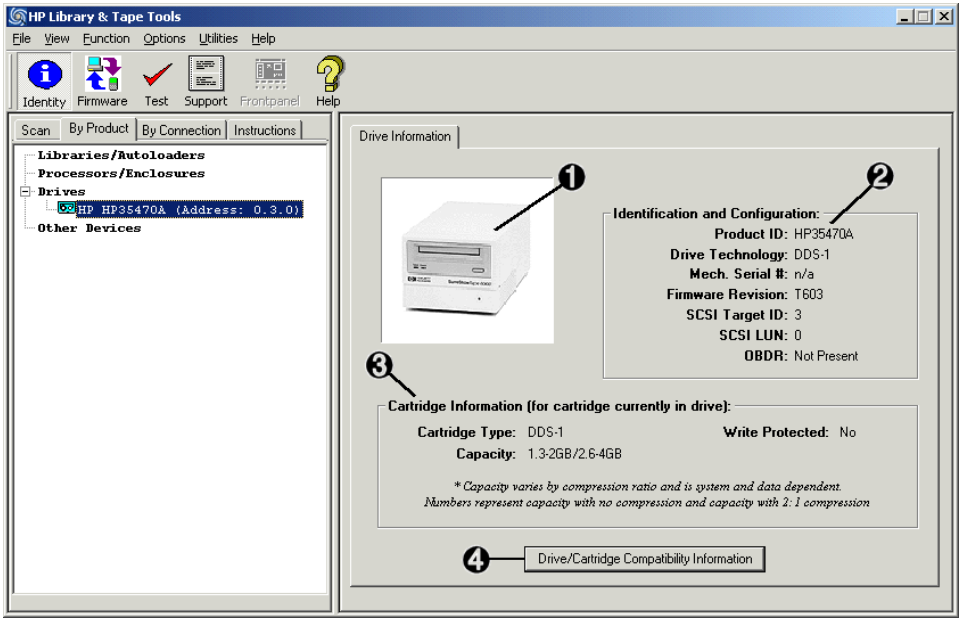

Figure 3: Device Information screen showing a standalone device

❶	This provides a visual representation of the selected product (the images are in grayscale).
❷	This provides the following general information on the product: ■ Product ID (Inquiry String) ■ Drive Technology (DDS/DL/LTO) ■ Mech Serial # (Drive serial number) ■ Firmware Revision ■ SCSI Target ID ■ SCSI LUN
❸	If a data cartridge was inserted in the drive when the identity tool was selected (or when the current screen was "refreshed"), information regarding cartridge type, capacity, and write protect status is shown here.
❹	Click this button to display a list of media that is compatible with the product.

Library and Autoloader Products

When a library or autoloader is selected in the **Device List**, the **Device Information** screen displays two tabs: one for library information and one for the drives contained within the library, as shown in Figure 4.

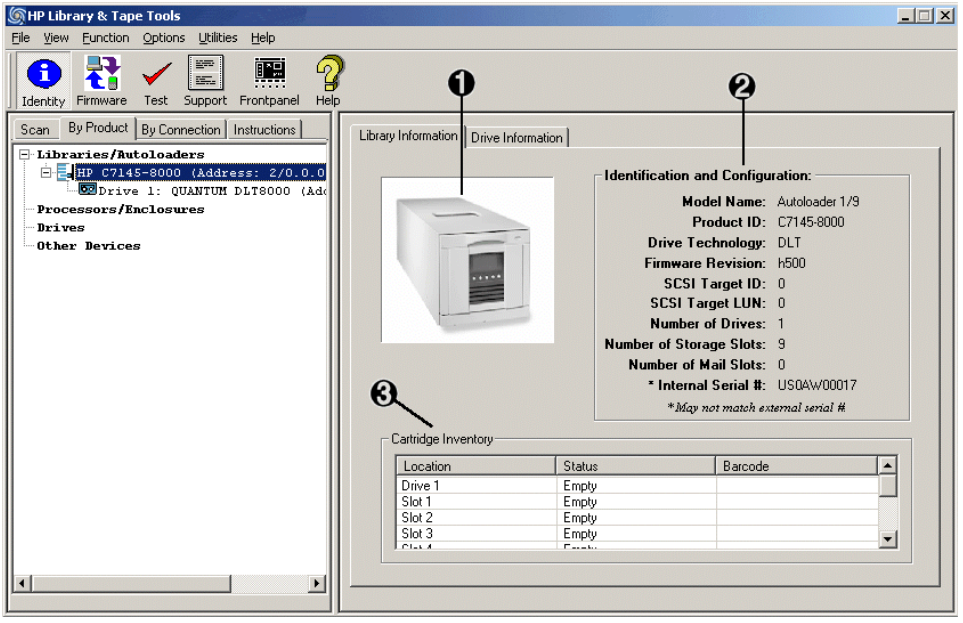

Figure 4: Device Information screen showing a library

❶	This provides a visual representation of the selected product (the images are in grayscale).
❷	As with a standalone drive, this area provides the relevant information on the selected library product.
❸	This provides a cartridge (media) inventory for all the drives and slots. The current status (full or empty) of all the storage elements and the barcode number (if barcode reading is available) is displayed here.

To see information for the drives within the library, select the **Drive Information** tab. This tab displays a screen very similar to the one for standalone products, with the addition of the **Selected Drive** dropdown menu.

Because a library can contain multiple drives, you can select and view information for each drive using the **Selected Drive** dropdown menu. All of the drives in the library are available in the dropdown menu.

Note: Selecting individual drives within a library from the By Product/By Connection device list displays the drive as though it were a standalone product. The recommended method of diagnosing embedded drives is to first select the library they belong to, and then select the specific drive within each tool window.

GUI Using the Firmware Management Screen

The firmware management functionality of L&TT allows easy upgrades to the storage product firmware. To access the **Firmware Management** screen, click the device you want to update in the device list, then click the **Firmware** button on the main toolbar. Figure 5 shows the **Firmware Management** screen.

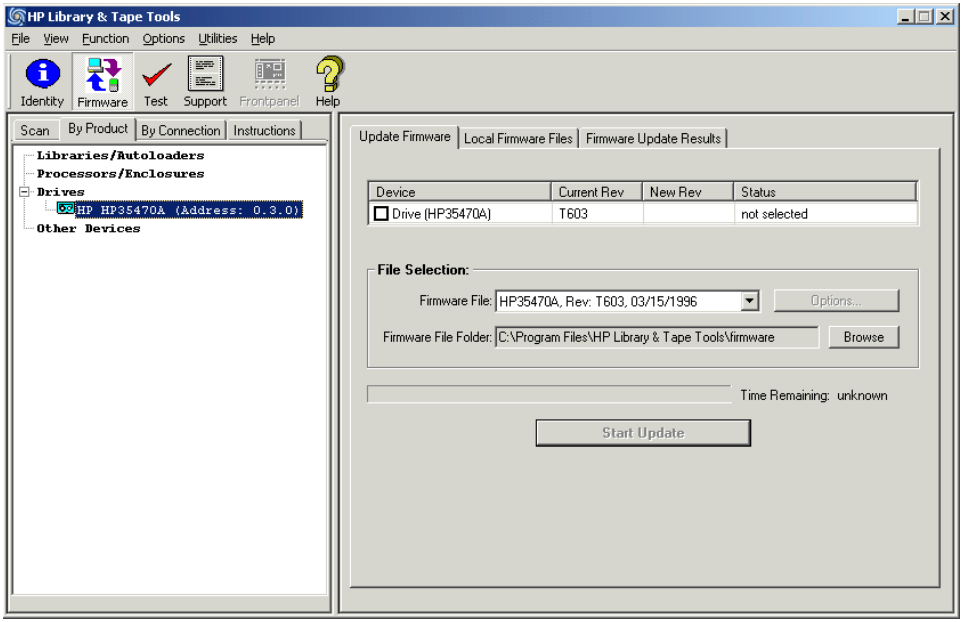

Figure 5: Firmware Management screen

For detailed information about the firmware management functionality of L&TT, see Firmware Management.

GUI Using the Tests Screen

L&TT provides several standard and advanced tests that can be used to check the performance of or to diagnose issues with storage hardware. To access the **Tests** screen, click the device you want to test in the device list, then click the **Tests** button on the main toolbar. Figure 6 shows the **Tests** screen.

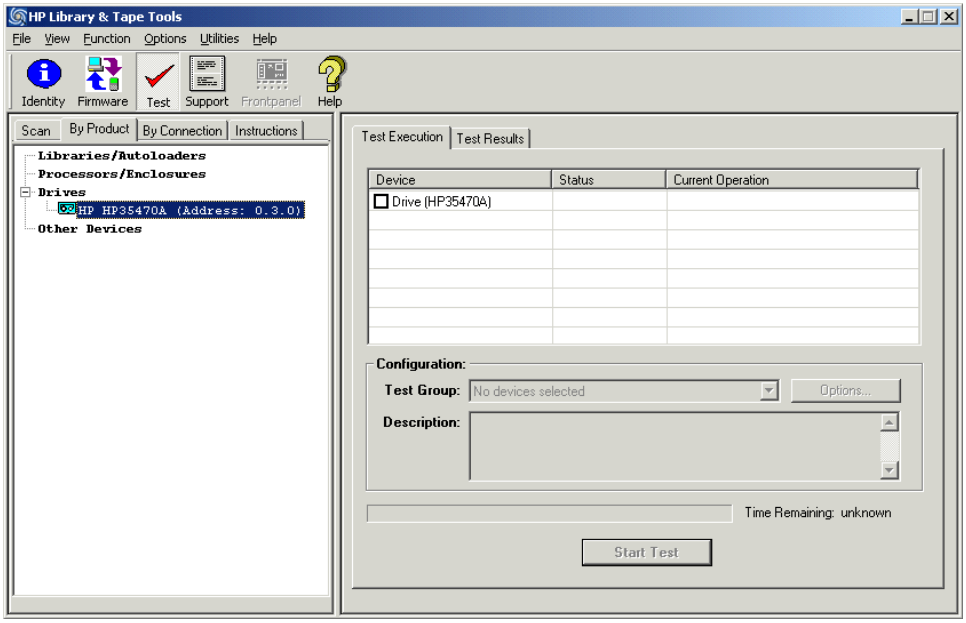

Figure 6: Tests screen

For detailed information about the **Tests** screen, as well as information about how to perform the tests and interpret test results, see Tests and Utility Functions.

GUI Using the Support Ticket Generation Screen

L&TT can automatically generate a support ticket based on information that the program determines about the system. The information in this support ticket can then be used to diagnose storage hardware issues. L&TT can automatically e-mail the support ticket to the HP help desk to assist the help desk technician in resolving issues.

To access the **Support Ticket Generation** screen, click the device you want to generate the support ticket for in the device list, and then click the **Support** button on the main toolbar. Figure 7 shows the **Support Ticket Generation** screen.

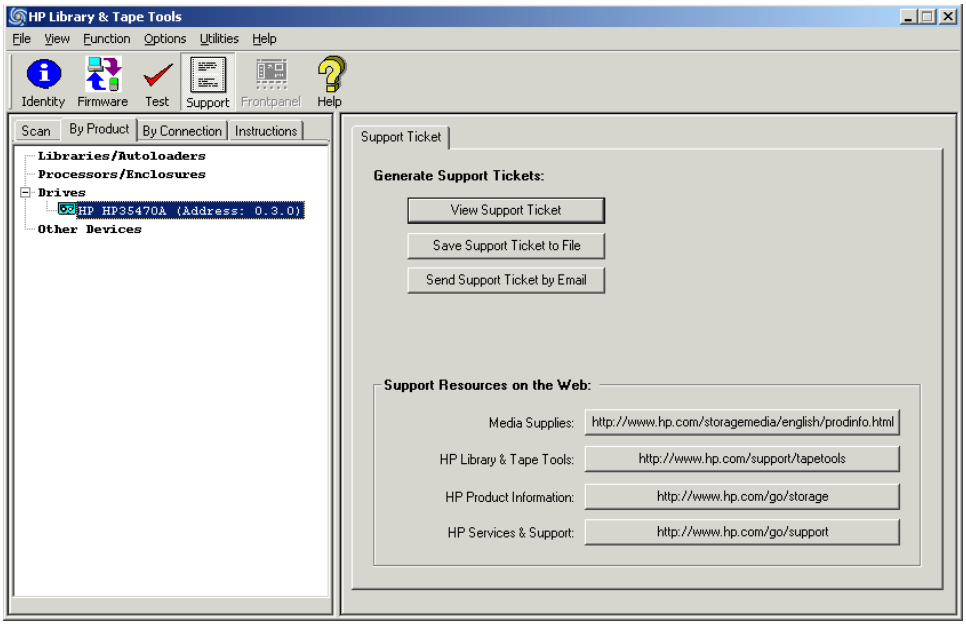

Figure 7: Support Ticket Generation screen

For detailed information about generating and using support tickets, see Support Ticket Generation.

CSI Starting L&TT

To start L&TT:

- For HP-UX, Tru64, and Linux:

  Log on as root and execute the following commands:

  ```
  cd /opt/ltt
  ./hp_ltt
  ```

- For Novell NetWare

  From the server console, execute the following command:

  ```
  hp_ltt\hp_ltt
  ```

When the CSI version of L&TT is started, an information screen is displayed that offers basic information about navigating the screens. Press any key to bypass this screen and start the device scan. L&TT scans the system for connected devices. When the scan is complete, the **Main** screen is displayed, as shown in Figure 8.

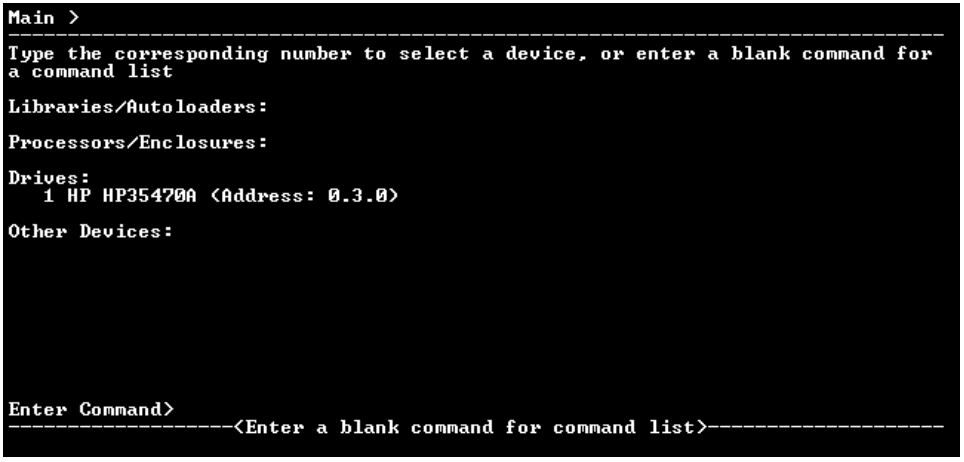

Figure 8: CSI Main screen

CSI Navigating the Screens

The top line of each screen displays the current screen name in hierarchical format. Each "level" of screens is separated by the ">" character. On each screen, some of the available commands take you to a lower level in the hierarchy. To move back to the previous level, use the `up` command. To exit L&TT, use the `exit` command.

On most of the screens, entering a blank command (pressing **Enter** without typing any other text) displays a **Command Help** screen. This screen contains a list of valid commands that can be executed on the original screen from which the **Command Help** screen was accessed. Figure 9 shows the **Command Help** screen accessed from the **Main** screen.

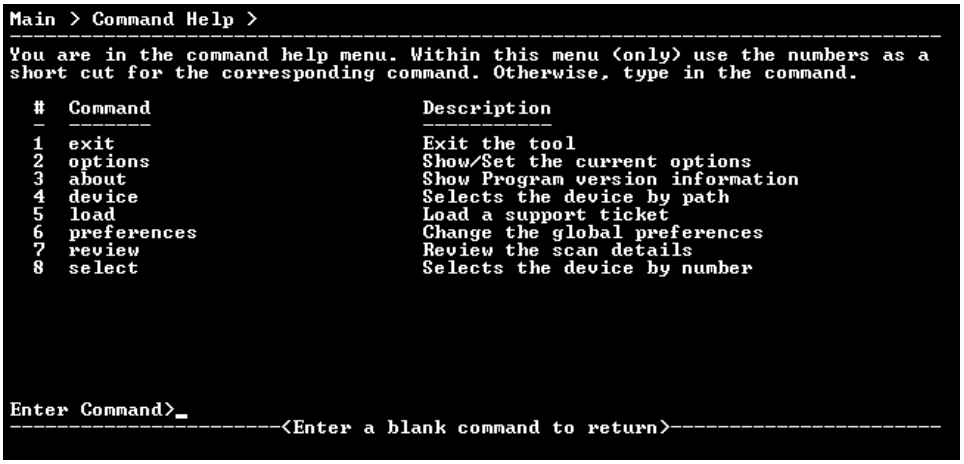
Main > Command Help >
You are in the command help menu. Within this menu (only) use the numbers as a short cut for the corresponding command. Otherwise, type in the command.
Command Description
1 exit Exit the tool
2 options Show/Set the current options
3 about Show Program version information
4 device Selects the device by path
5 load Load a support ticket
6 preferences Change the global preferences
7 review Review the scan details
8 select Selects the device by number
Enter Command>
<Enter a blank command to return>

Figure 9: Command Help screen accessed from the Main screen

It is possible to enter a command directly from the **Command Help** screen. To do this, type either the number of the command or the name of the command and press **Enter**. Entering the number of the command only works on the **Command Help** screen. From any other screen, you must type the full name of the command. To exit the **Command Help** screen, enter a blank command (press **Enter**).

Some commands require an argument. For example, the `select` command requires a number that corresponds to the device you want to select in the device list. To select the first device in the list, the syntax is:

```
select 1
```

If you enter a command with an invalid or missing argument, an error message is displayed.

CSI Using the Device Information Screen

When you first select a product from the **Main** screen, the **Device Information** screen is displayed, showing information relevant to the device.

The main purpose of the **Device Information** screen is to provide an overview of the configuration and status of the selected hardware device.

From the **Main** screen, type the following command to access the **Device Information** screen:

`select` <*n*> (where <*n*> is the number of the device to be examined)

Note: Alternatively, you can omit the `select` command and only enter the device number.

Standalone Devices

Figure 10 shows the **Device Information** screen for a standalone device.

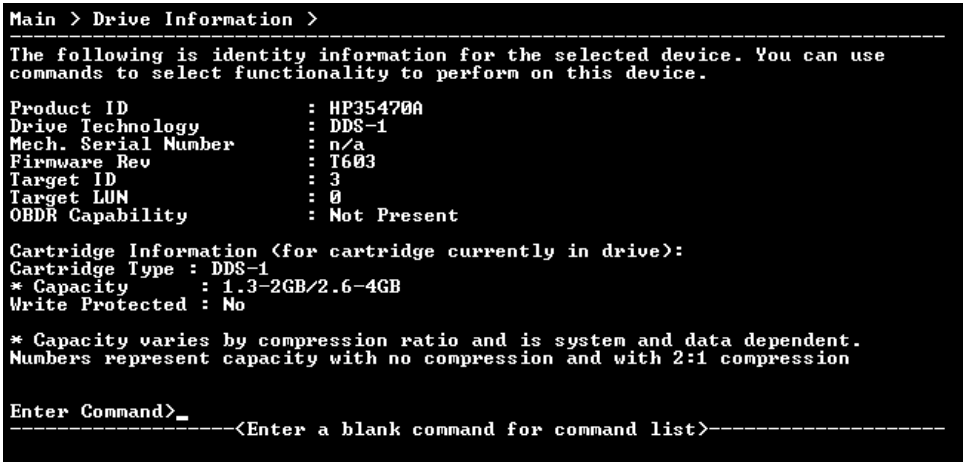
Main > Drive Information >
The following is identity information for the selected device. You can use commands to select functionality to perform on this device.
Product ID : HP35470A
Drive Technology : DDS-1
Mech. Serial Number : n/a
Firmware Rev : T603
Target ID : 3
Target LUN : 0
OBDR Capability : Not Present
Cartridge Information (for cartridge currently in drive):
Cartridge Type : DDS-1
* Capacity : 1.3-2GB/2.6-4GB
Write Protected : No
* Capacity varies by compression ratio and is system and data dependent.
Numbers represent capacity with no compression and with 2:1 compression
Enter Command>
<Enter a blank command for command list>

Figure 10: Device Information screen for a standalone device

The following general information is displayed:

- Product ID (inquiry string)
- Drive technology
- Mech. serial # (drive serial number)
- Firmware revision
- SCSI target ID
- SCSI LUN
- OBDR capability (if present)

If a data cartridge was inserted in the drive when the **Device Information** screen was displayed, information regarding cartridge type, capacity, and write-protect status is shown.

To see a list of compatible media that can be used with this device, use the `inventory` command.

Library and Autoloader Products

Figure 11 shows the **Device Information** screen for a library.

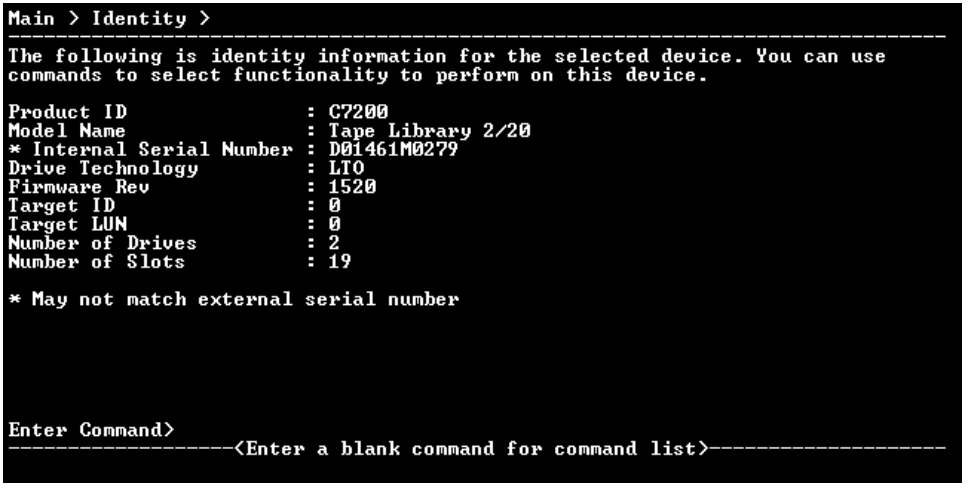

Figure 11: Device Information screen showing a library

Note: Selecting individual drives within a library from the device list displays the drive as though it were a standalone product. Embedded drives are best diagnosed by selecting the library they belong to, and then selecting the specific drive within each tool window.

From the **Device Information** screen for a library device, use the `inventory` command to display the slot inventory of the library. The inventory command shows which slots and drives currently have cartridges loaded, and the cartridge barcode if available and applicable.

Firmware Management

4

The Firmware Management functionality of L&TT provides a convenient way to easily upgrade the firmware of connected devices. Library firmware and firmware of drives within the libraries can be upgraded as well. In many cases, multiple drives within the library can be updated simultaneously to save time.

L&TT uses special firmware files that associate the firmware with a particular product. This feature prevents the user from downloading the wrong image and ensures that the downloaded firmware is the same or a newer revision than the current device firmware.

Click your operating environment:

GUI Acquiring Firmware Files

L&TT firmware files are stored in the `Firmware` directory. This directory is a subdirectory of the `HP Library & Tape Tools` installation directory. Before upgrading any firmware, you must first acquire the firmware image file or files and copy them to the `Firmware` directory. Firmware files can be obtained in three ways:

1. Select the device in the device listing and click the **Firmware** button on the main toolbar. On the **Firmware** screen, click the **Local Files** tab, and then click the **Get Files from Web** button at the bottom of the tab. The downloaded files are automatically placed in the `Firmware` directory.
2. From the L&TT menu bar, select **Get Files From Web** from the **File** menu. The software links to the L&TT firmware ftp site and allows the selected firmware files to be copied to your system. Downloaded files are automatically placed in the `Firmware` directory. This option is explained in detail in the following section.
3. Go to www.hp.com/support, choose the product family, then click **software updates and drivers**. The latest firmware file is available in L&TT format. For some products (such as standalone drives), firmware is available as a single file. For other products (such as tape libraries), the firmware is available in a self-extracting bundle that includes library and drive firmware.

Note: Do not use the **Get Firmware From Web** functionality within L&TT without an Internet connection. Doing so can cause the system to lock up until it has timed out in the operating system. This timeout value is operating system-specific.

Note: If **Check for Updates on Web** is enabled in the tool preferences, L&TT automatically informs the user when new firmware is available for any of the connected storage products. L&TT performs this check each time it is started (but not more than once per 24-hour period).

Using the Get Files from Web Functionality

The Windows version of L&TT offers comprehensive firmware management functionality that finds and downloads firmware from the HP website. This functionality obtains the most up-to-date information about all available firmware files directly from the HP website. It then compares this data set against the list of devices connected to the system and the current firmware revisions present in those devices. Depending on the selected filter options on the top of the screen, different subsets of firmware files are presented. Firmware files that are needed to bring the connected devices up to the latest firmware revisions are automatically selected.

Note: L&TT scripts are also obtained using the **Get Files from Web** dialog box. For more information on scripts, see Downloading New and Updated Scripts.

Accessing the Get Files from Web Dialog Box

You can access the **Get Files from Web** dialog box in two ways:

- Select **Get Files from Web** from the **File** menu

  - or -

- Click the **Get Firmware** button on the **Firmware Update** screen

The **Get Files from Web** dialog box is displayed. Click the **Firmware (New Files Available)** tab if it is not already selected. Figure 12 shows the **Get Files from Web** dialog box for firmware.

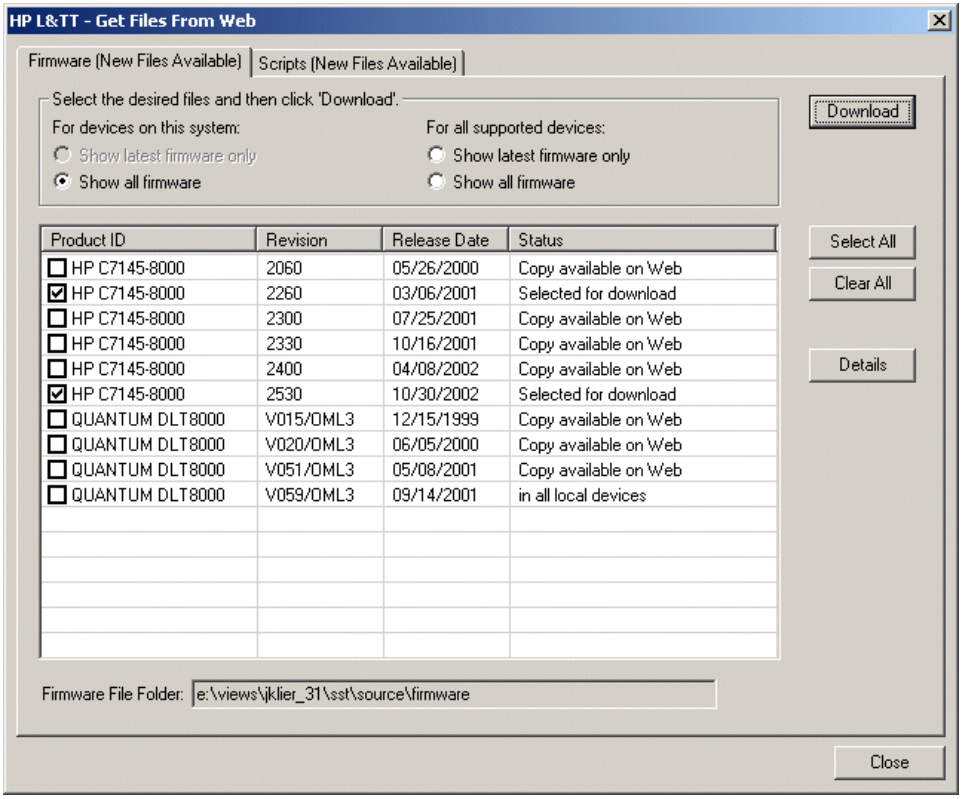
HP L&TT - Get Files From Web
Firmware (New Files Available)
Scripts (New Files Available)
Select the desired files and then click 'Download'.
For devices on this system:
Show latest firmware only
Show all firmware
For all supported devices:
Show latest firmware only
Show all firmware
Download
Product ID
Revision
Release Date
Status
HP C7145-8000 2060 05/26/2000 Copy available on Web
HP C7145-8000 2260 03/06/2001 Selected for download
HP C7145-8000 2300 07/25/2001 Copy available on Web
HP C7145-8000 2330 10/16/2001 Copy available on Web
HP C7145-8000 2400 04/08/2002 Copy available on Web
HP C7145-8000 2530 10/30/2002 Selected for download
QUANTUM DLT8000 V015/OML3 12/15/1999 Copy available on Web
QUANTUM DLT8000 V020/OML3 06/05/2000 Copy available on Web
QUANTUM DLT8000 V051/OML3 05/08/2001 Copy available on Web
QUANTUM DLT8000 V059/OML3 09/14/2001 in all local devices
Select All
Clear All
Details
Firmware File Folder:
e:\views\jklier_31\sst\source\firmware
Close

Figure 12: Get Files from Web dialog box—Firmware tab

Selecting and Downloading Updated Firmware Files

The **Get Files from Web** dialog box has four filter options:

- **For devices on this system**—These two options only show firmware files matching devices that are currently connected to the system.
  - **Show latest firmware only** shows the most recent firmware revision for each device.
  - **Show all firmware** shows all firmware revisions for each of these firmware files.

- **For all supported devices**—These two options show firmware files for all devices supported by LTT, even if not currently connected to the system.
  - **Show latest firmware only** shows the most recent firmware revision for each device.
  - **Show all firmware** shows all firmware revisions for each of these firmware files.

Select the appropriate option, and then verify that the correct firmware files are selected. To download the selected files, click **Download**. The files are automatically downloaded to the current firmware directory on the local system. You can now use the firmware update functionality of L&TT to upload the latest firmware to your devices.

Viewing Firmware Revision History

In addition to downloading firmware files, the **Get Files from Web** dialog box provides revision history detail for firmware files. To view the firmware revision history of a device, select a device and click **Details**.

GUI Uploading Firmware to Devices

Before attempting to update any firmware files, you must first acquire the latest firmware files and ensure that they are placed in the `Firmware` directory. If you have not yet done this, see Acquiring Firmware Files.

To upload firmware to a device:

1. Click the device to update in the device list.
2. Click the **Firmware** button on the main toolbar.
3. On the **Update Firmware** tab, click the checkbox next to the device name to select it. If firmware is currently available for that device, it is shown in the **Firmware File** dropdown box in the **File Selection** section of the screen.

Note: You can select multiple devices and update them simultaneously.

4. Click the **Start Update** button at the bottom of the screen to begin the update.

Caution: Make sure that no other programs attempt to access the device while the firmware is being updated. Do not interrupt the firmware update. If the firmware update is interrupted, the device may not operate and require physical repair.

L&TT creates a log of all firmware update activity. To view this log, click the **Firmware Update Results** tab. Set the **Current Detail Level** setting to the appropriate level. The default is **Normal**. The firmware log is displayed in a standard tree-view format. If you want to clear the log, click the **Clear Log** button.

GUI Advanced Options

It is sometimes necessary to disable L&TT safeguards to perform more advanced operations. These operations (options) are only available after the necessary password has been entered. To obtain this password, contact HP support. After a password has been entered, the **Options** button on the **Update Firmware** tab becomes available. When you click this button, the **Factory Firmware Overrides** dialog box is displayed (this dialog box varies slightly between drives and libraries):

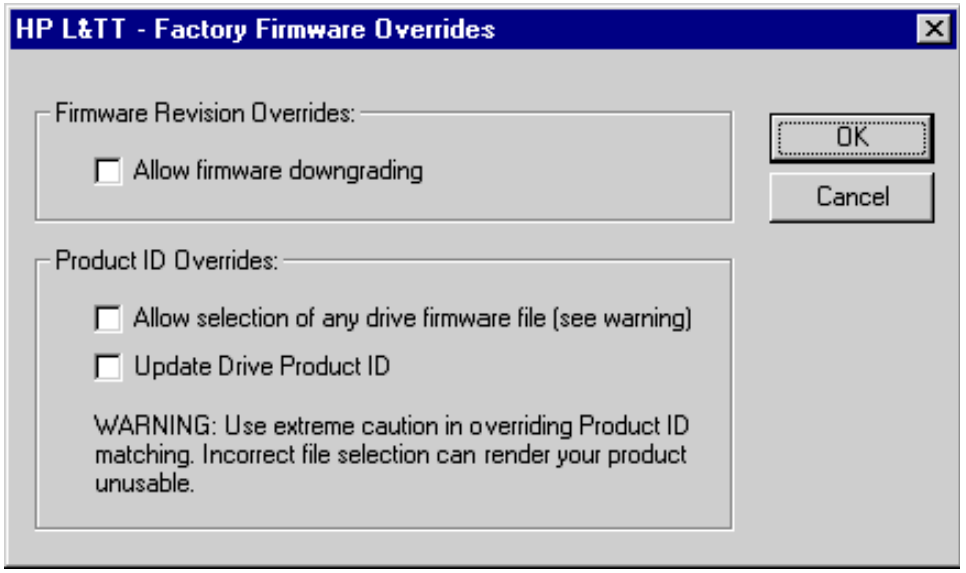
HP L&TT - Factory Firmware Overrides
Firmware Revision Overrides:
Allow firmware downgrading
OK
Cancel
Product ID Overrides:
Allow selection of any drive firmware file (see warning)
Update Drive Product ID
WARNING: Use extreme caution in overriding Product ID matching. Incorrect file selection can render your product unusable.

Figure 13: Factory Firmware Overrides dialog box

The **Factory Firmware Overrides** dialog box presents the following three options:

- **Allow firmware downgrading**—By default, L&TT does not show files with older revision levels as selectable. On the **Local Firmware Files** tab, the comment field displays the message "downgrade password required." In most cases, you should use the latest firmware. However, if software incompatibilities or other customer limitations require the use of older firmware revisions, this check box lets you downgrade to older firmware revisions.

- **Allow selection of any [drive or library] firmware file**—This option allows mapping of the device firmware to a product, irrespective of the device's product ID. There are a few cases in which the product ID does not match the desired firmware file (and the ID may also need to be updated). One case is when a library is being updated from one drive technology to another. Another case is when the device has a firmware revision string format that differs from that in the firmware file, and the tool cannot determine whether it is newer or older. If incompatible firmware is sent to a device, an error message is displayed.
- **Update [drive or library] product ID**—This writes the product ID from the firmware file to the drive.

Note: A number of products may not support updating the product ID, so use this feature only when you know the device supports it. The most common use of this feature is when updating drive technologies in optical libraries.

CSI Acquiring Firmware Files

L&TT firmware files are stored in the `firmware` directory, which is a subdirectory of the `HP Library & Tape Tools` installation directory. Before upgrading any firmware, you must first acquire the firmware image file or files and copy them to the `firmware` directory.

To download the latest firmware files:

1. Go to www.hp.com/support, choose the product family, then click **software updates and drivers**. The latest firmware file is available in L&TT format. For some products (such as standalone drives), firmware is available as a single file. For other products (such as tape libraries), the firmware is available in a self-extracting bundle that includes library and drive firmware.
2. Download the file or files to the `firmware` directory.
3. If the downloaded files are self-extracting bundles, extract the contents to the `firmware` directory.

CSI Uploading Firmware to Devices

To upload firmware to one or more devices:

1. From the **Main** screen, type the number corresponding to the device to be updated and press **Enter** to display the **Device Information** screen.
2. From the **Device Information** screen, enter the `firmware` command to display the **Firmware Update** screen. Devices that are available for update are listed on this screen.
3. Type the corresponding number of the device you want to update and press **Enter** to mark the device "selected." If there are multiple devices, repeat this step for each device that you want to update.
4. When all the required devices are selected, enter the `start` command to begin the update process.

Caution: Make sure that no other programs attempt to access the device while the firmware is being updated. Do not interrupt the firmware update. If the firmware update is interrupted, the device may not operate and require physical repair.

L&TT creates a log of all firmware update activity. To view this log, enter the `review` command from the **Firmware Update** screen.

CSI Advanced Options

Sometimes it is necessary to disable L&TT safeguards to perform more advanced operations. These operations (options) are only available after the necessary password has been entered. To obtain this password, contact HP support. To view the **Options** screen, from the **Firmware Update** screen, enter the `options` command.

Before any of the options can be changed, the current password must be set. To set the password:

1. Type the number that corresponds to the password option and press **Enter**. L&TT prompts you to enter a value for "`Current password entered`."
2. Type the password and press **Enter**. If the correct password is entered, the remaining options on this screen become available.

Note: All of the options are visible regardless of whether a proper password is entered or not. However, the options are not available without the proper password. After a proper password has been entered, it is not required to re-enter it later.

The following options are available:

- **Allow firmware downgrading**—By default, L&TT does not allow firmware downgrading. In most cases, you should use the latest firmware. However, if software incompatibilities or other customer limitations require the use of older firmware revisions, this option lets you downgrade to older firmware revisions.
- **Allow any firmware file for [drives or libraries]**—This option allows mapping of the device firmware to a product irrespective of the device's product ID. There are a few cases in which the product ID does not match the desired firmware file (and the ID may also need to be updated). One case is when a library is being updated from one drive technology to another. Another case is when the device has a firmware revision string format that differs from that in the firmware file, and the tool cannot determine whether it is newer or older. If incompatible firmware is sent to a device, an error message is displayed.
- **Allow Product ID updates on [drives or libraries]**—This writes the product ID from the firmware file to the drive.

- **Current password entered**—This option lets you enter the factory password. The currently entered password is displayed to the right of the option. If no password has been entered, `Not Set` is displayed.

Note: A number of products may not support updating the product ID, so use this feature only when you know the device supports it. The most common use of this feature is when updating drive technologies in optical libraries.

Tests and Utility Functions

5

L&TT provides numerous tests for analyzing storage hardware. L&TT tests are SCSI script-based. A SCSI script is a sequence of SCSI commands sent to a device, usually for the purpose of testing the device's functionality. SCSI scripts can also be used to perform non-diagnostic utility functions, such as rewinding a tape, recalibrating a tape head, or "exercising" a tape-moving robot arm.

L&TT uses the following three types of SCSI scripts:

- **Built-in tests** are hardcoded into the program and are installed during the L&TT installation process.
- **Script-based tests** are additional tests based on scripts that are stored in the `scripts` directory in the L&TT installation directory. The script-based test files have the **.tst* extension. Users can download new and updated scripts. With the Windows version of L&TT, the management of script files is accomplished through the **Get files from Web** item on the **File** menu.

  HP is constantly adding scripts for new devices and updating scripts to enhance the testing functionality of older devices. As new scripts are developed, they are published to the external website in the scripts section.
- **SCSI utility scripts** provide access to generic SCSI operations. These scripts are accessed by selecting **Run Script...** from the **Utilities** menu and have the **.scc* extension. For more information, see Using the Utility Functions.

Each script file contains information that tells L&TT which devices it is designed to support. When a device is selected, the **Tests** screen displays only tests that are applicable to that particular device. From the user's standpoint, there is no difference between the built-in tests and the script-based tests.

All scripts have a digital signature and cannot be altered. If they are altered in a text editor, L&TT displays an error message stating that the digital signature is not correct.

Test Descriptions

This section lists the most common built-in tests and script-based tests.

Caution: Some tests are destructive to data on the media. When a test is destructive to data, this is indicated in the test description. To prevent data loss, use media that is either new or that contains unimportant data that can be erased. Do not attempt to perform a test unless you are thoroughly familiar with its usage, or have been instructed to do so by HP support personnel.

Built-In Tests

- **Connectivity Test** examines the ability of the host to communicate with the device. This is a test of the SCSI communication path only; no media is required. This option is useful when trying to establish that the SCSI cables and adapters are working correctly. This test is available for DLT, LTO, and DDS drives only.
- **Device Self-Test** executes the internal self-test of the device, and any failure is reported. This test is useful in confirming that the device itself is operating properly. Not all devices support an internal self-test.
- **Device Analysis Test** runs a device-specific script that carries out a detailed examination of the device. The test examines all available logs from the device to look for any known issues, customer use issues, and common error patterns. The test also provides summary information and presents suggestions as to the cause of certain errors and any remedial actions the user should take. This option is particularly useful if you suspect that there may be a problem with the device. The device analysis test is covered in greater detail in the Using the Device Analysis Test section.
- **Read/Write Test** writes and reads data from tape. In addition to verifying that the data read-back matches the data written, the read/write error rates are also checked, and the test fails if the error rates exceed allowable limits. This test can be used to verify the ability of the drive to read and write data independent of the storage application. Use a blank tape when performing this test because this test is destructive to data on the tape. This test is available for all tape drives.
- **Media Validation Test** determines if the drive can read the data on any media currently in the drive. The test is used to determine the quality of the media. The test reads data from the media and calculates the error rate. If the error

rate exceeds the maximum allowable threshold, the test will require a cleaning cartridge and a second tape to determine if the problem is with the drive or the tape. The amount of data read depends on the drive type and coverage level of the test, but it generally varies between a few megabytes and one gigabyte. No data is written to tape and the test is not destructive to data. This test is useful if the user suspects that a backup failed because of a bad tape. This test is available for all tape drives.

Note: This test requires that a minimum amount of data is already written on the tape, otherwise the test will fail. This amount of data varies depending on drive technology and options.

- **Library Exerciser Test** takes a test cartridge from a mail slot and performs random slot-to-slot moves. The test then moves the test cartridge into every available drive and performs a short drive test. This test is intended to exercise the robotics and robot drive hardware.

Script-Based Tests

- **Compression Test** writes a data pattern of known compressibility to tape. The test then rewinds the tape and reads the file just written. The read and write hardware compression ratios are calculated to ascertain that the hardware compression is enabled and working. If the script finds that hardware compression has been disabled by the host or by switch configuration, it reports this to the user. The compression ratios are displayed to the user and should be approximately 2:1. This test is useful if tape capacity or hardware compression is in doubt. This test is available for DLT, LTO, and DDS drives only.
- **DLT FUP Creation Test** takes a firmware image and writes it to a tape cartridge for use as a firmware update (FUP) tape. This test is available for DLT, DLT1, SDLT, and VS-80 drives.
- **LTO FUP Creation Test** takes a firmware image and writes it to a tape cartridge for use as a FUP tape. This test is only available for LTO drives.
- **DLT SRAM Check Tests (short and long versions)** check drive logs for existing evidence of SRAM chip corruption, and they perform a read/write test to check the drive for susceptibility to SRAM corruption problems. The test is destructive to data on the cartridge in the drive. These tests are only available for DLT drives.

- **Initalize Element Status Test** performs an `initialize element status` command on the library. This test is available for all libraries.
- **Lateral Motion Test** performs lateral motions of the robotics to enhance performance of brush tracks. This test is available for C7200 library models only.
- **MO Configuration Test + Reset** checks the configuration parameters of the MO drive and identifies configurations that differ from the factory default settings. If settings differ, the test can reset the drive to the factory defaults. This test is only available for MO drives.
- **LTO Thermal Test** monitors the temperature sensors of an LTO drive to ensure that the drive is cooling properly when installed in a server.
- **DLT Acceptance Test** correlates with testing that is currently done on returned drives. If the DLT8000 acceptance test fails, then this same drive would probably fail testing within the return process. If the DLT8000 acceptance test passes, then this same drive would probably pass testing within the return process. Correlation testing between this test and the test used within the return process has shown good results.

  The DLT8000 acceptance test performs the following tests:

  — SCSI interconnect test

  — Review event log entries (which were present prior to running this test)

  — Load the test tape

  — Quick write/read test

  — Soft unload/load test

  — Minimum block size test

  — Diagnostic self test (built-in drive function)

  — Read/write tests, using various data patterns

  — Bit error rate test

  — Review new event log entries added during the test

  — Unload the test tape
- **ESL Vendor ID** toggles the vendor ID between HP and COMPAQ on ESL libraries having firmware revision 3.40 and later. This may be necessary because firmware revision 3.40 and later has a vendor ID of HP, and there may be some applications that require the vendor ID to be COMPAQ.

Using the Device Analysis Test

The Device Analysis test can be executed manually through the **Tests** screen or automatically whenever a support ticket is generated. The Device Analysis test is unique among all the tests offered by L&TT. In addition to performing SCSI operations directly on a device, the Device Analysis test uses a set of predefined, device-specific rules to analyze device logs and configurations. If any known issues are discovered during the analysis, the user is notified of the problem and the program suggests an appropriate course of action.

The Device Analysis test automates failure analysis of a device by determining whether a problem exists with a device, and if so, if the problem can be resolved in the field through maintenance or simple repair, whether a device needs to be returned or serviced, or whether the device has an unknown problem.

GUI Running the Tests (GUI Environment)

To select and run a test manually:

1. In the device listing (either the **By Product** or **By Connection** tab), click the device to test.
2. Click **Test** on the main toolbar. The **Tests** screen is displayed and the **Test Execution** tab is selected by default.
3. Click the checkbox to the left of the device name that you want to test. The **Test Group** dropdown box is enabled, listing all the tests available for the selected device.
4. In the **Test Group** dropdown box, select the test to perform. A description of the selected test is displayed in the **Description** text box.
5. If any options are available for the selected test, the **Options** button is enabled. Click the **Options** button to review and set the desired options.
6. Click the **Start Test** button to start the test.

Viewing Test Results

After the test has completed, click the **Test Results** tab to view the results. The results of the test are displayed in the **Test** text box. A more detailed Test Operation Log is displayed in the bottom section of the screen. The information is presented as a report in a standard tree-view format. Click the "**+**" or "**–**" signs to expand or collapse a section of the report. Select an option in the **Current Detail Level** dropdown box to display more or less information in the Test Operation Log.

CSI Running the Tests (CSI Environment)

To select and run a test manually:

1. On the **Main** screen, enter the number corresponding to the device that you want to test. The **Device Information** screen is displayed.
2. On the **Device Information** screen, enter the `test` command. The **Test** screen is displayed. The **Test** screen displays the currently selected test and lists the available devices to be tested.
3. To select a different test, enter the `picktest` command. On the **Selector** screen, enter the number of the test you want to perform. The **Test** screen is redisplayed and the currently selected test is updated.
4. To select or deselect devices to be tested, enter the corresponding device number to toggle the selected status of the device. To deselect all devices, enter the `clear` command.
5. Enter the `start` command to start the test.
6. When the test is complete, a dialog is displayed showing preliminary results of the test. Press any key to return to the **Test** screen.

Viewing Test Results

To view detailed test results, enter the `review` command. Test results are displayed in a hierarchichal format.

Use the `detail` command without any arguments to view the current detail level of the report. Use the `detail` command with a numeric argument to set the detail level. The available detail level arguments are as follows:

- **1** — highlights only
- **2** — normal
- **3** — more details
- **4** — everything
- **5** — factory only (requires a factory password. To enter a password, use the `options` command.)

If necessary, use **Ctrl+U** and **Ctrl+D** to scroll up and down through the results. Use the `find` and `page` commands to quickly locate information in the report.

GUI Using the Utility Functions

The utility functions are only available with the Windows version of L&TT. Utility functions execute the SCSI utility scripts (files with a *.*scc* extension) stored in the `scripts` directory. These scripts send various SCSI commands to the selected device, but they generally do not return any results.

Many of the utility functions are device-specific and intended only to remedy specific problems that may occur with a particular device.

Caution: Using a script improperly or when it is not required can cause more harm than good—possibly rendering a device inoperable. Do not attempt to use these utility functions unless you are very familiar with SCSI operation, or you have been advised to do so by a technical support representative or a Device Analysis script.

To use a utility function:

1. Select **Run Script...** from the **Utilities** menu to display the **Run Script** dialog.
2. In the **Devices** section, click the check box next to the device on which the script will be run.
3. Click **Browse** to select a script file to execute. The utility scripts are located in the scripts directory and have a *.*scc* extension. Select a script and click **Open** to return to the **Run Script** dialog.
4. Click **Run Script** at the bottom of the dialog box to run the script. When the script has completed, relevant information is displayed in the **Script Output** and **Script Execution Log** text boxes.

GUI Downloading New and Updated Scripts

The Windows version of L&TT provides a convenient way to download the latest scripts to the scripts directory of the local system. This functionality is similar to the procedure for downloading firmware, except that the purpose is to manage the script files on the local system. The function displays a list of all available script files and compares this list to the list of scripts currently on the local system. The function automatically selects scripts that are not on the local system, or that are newer than their locally installed equivalents.

Note: Firmware files are also obtained using the **Get Files from Web** dialog box. For more information on downloading firmware, see Using the Get Files from Web Functionality.

To access this functionality, select **Get Files from Web** from the **File** menu. The **Get Files from Web** dialog box is displayed. Click the **Scripts (New Files Available)** tab if it is not already selected.

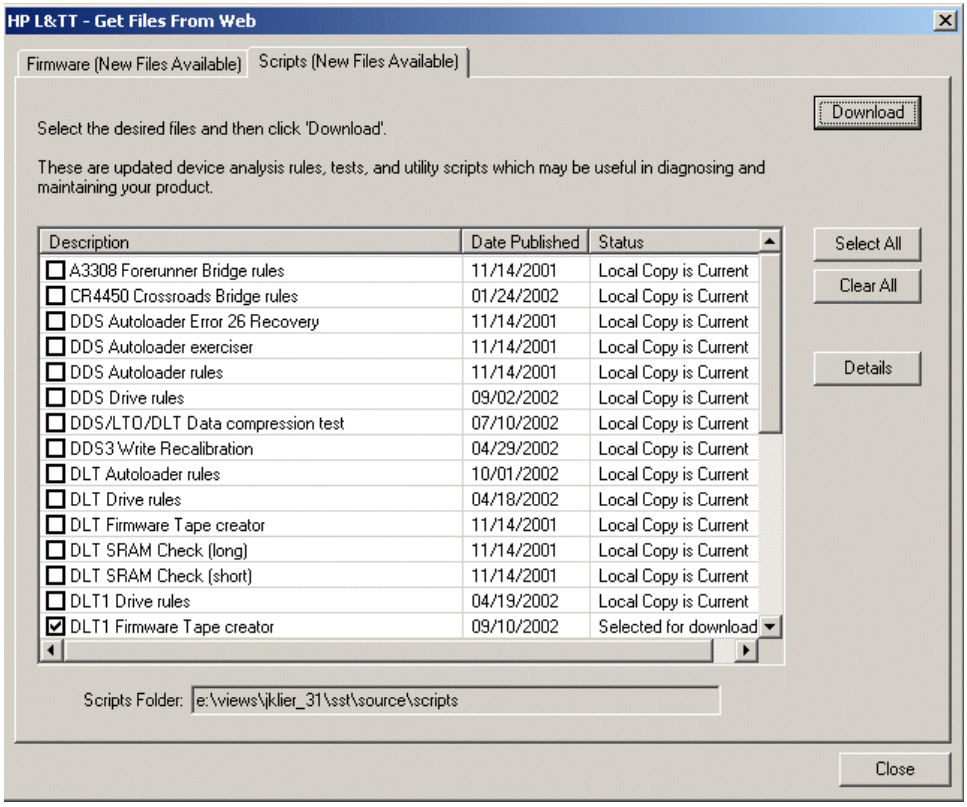
HP L&TT - Get Files From Web
Firmware (New Files Available)
Scripts (New Files Available)
Download
Select the desired files and then click 'Download'.
These are updated device analysis rules, tests, and utility scripts which may be useful in diagnosing and maintaining your product.
Description
Date Published
Status
A3308 Forerunner Bridge rules 11/14/2001 Local Copy is Current
CR4450 Crossroads Bridge rules 01/24/2002 Local Copy is Current
DDS Autoloader Error 26 Recovery 11/14/2001 Local Copy is Current
DDS Autoloader exerciser 11/14/2001 Local Copy is Current
DDS Autoloader rules 11/14/2001 Local Copy is Current
DDS Drive rules 09/02/2002 Local Copy is Current
DDS/LTO/DLT Data compression test 07/10/2002 Local Copy is Current
DDS3 Write Recalibration 04/29/2002 Local Copy is Current
DLT Autoloader rules 10/01/2002 Local Copy is Current
DLT Drive rules 04/18/2002 Local Copy is Current
DLT Firmware Tape creator 11/14/2001 Local Copy is Current
DLT SRAM Check (long) 11/14/2001 Local Copy is Current
DLT SRAM Check (short) 11/14/2001 Local Copy is Current
DLT1 Drive rules 04/19/2002 Local Copy is Current
DLT1 Firmware Tape creator 09/10/2002 Selected for download
Select All
Clear All
Details
Scripts Folder: e:\views\jklier_31\sst\source\scripts
Close

Figure 14: Get Files from Web dialog box—Scripts tab

Verify that the correct scripts are selected and click **Download**. The selected script files are copied into the `scripts` directory of the local system.

Support Ticket Generation

6

A major feature of L&TT is the ability to generate a support ticket. In the event of a hardware problem, a support ticket can provide vital information to help in diagnosing and resolving the problem.

When a support ticket is generated, L&TT collects configuration information and executes a Device Analysis test on the selected device. This information can then be viewed, saved, printed, or e-mailed. A support ticket is saved as a log file having the *.*ltt* extension. By default, log files are saved to the `log` directory.

The support ticket viewer is built into the L&TT application. The viewer enables viewing of detailed device information and general information on the system it is connected to. This information is displayed in a standard tree-view format. The user (or support technician) can change the detail level of the support ticket, browse through the support ticket information, and expand or collapse specific sections of the support ticket as required.

Note: Regardless of the selected detail level, the log file always contains all of the information collected from the product. The support ticket viewer filters this information, depending on the detail level.

L&TT support tickets are saved in a proprietary format and therefore require the support ticket viewer. However, with the Windows version of L&TT a support ticket can be converted to HTML format using the currently selected detail level. The HTML version can easily be printed or viewed by other users without the support ticket viewer.

Note: After an HTML support ticket has been generated, the detail level within the HTML file cannot be changed. Make sure that the detail level is set to the desired level before generating the HTML report.

Note: In the Windows version of L&TT, right-clicking on any of the text in the support ticket viewer displays a context menu with more options. A quick way to see the entire support ticket is to set the detail level to **everything** or **factory only**, right-click the top support ticket entry, then select **Expand All**.

GUI Generating and Viewing a Support Ticket

To open the **Support** screen:

1. Click a device in the device list (**By Product** or **By Connection** tab) to select it.
2. Click the **Support** button on the main toolbar to display the **Support** screen.

The bottom section of the screen provides resources for finding support on the Web. Clicking any of the buttons in the **Support Resources on the Web** section of the screen opens a browser window to display the corresponding website.

Generating a Support Ticket

The **Support** screen presents three options for generating a support ticket. Each of the following three options has a corresponding button in the **Generate Support Ticket** section of the screen.

- **View Support Ticket**—Click this button to generate the support ticket and immediately view it in the support ticket viewer. The support ticket can later be saved or sent via e-mail. For more information, see Viewing a Support Ticket.
- **Save Support Ticket to File**—Click this button to generate and save the support ticket. The support ticket is saved as a log file with the **.ltt* extension. The support ticket can later be viewed or sent via e-mail. To view a saved support ticket, open it through Windows Explorer, or use the **Load** command on the **File** menu.
- **Send Support Ticket by E-mail**—Click this button to generate the support ticket and immediately send it via e-mail to an HP support center (or other destination). Clicking this button opens a form that allows you to provide all the necessary information. Complete the form and click the **Send** button to send the e-mail. Using this option does not save a copy of the support ticket locally, so you are advised to click **Save Support Ticket to File** to save a copy for future reference. For more information, see Sending a Support Ticket by E-mail.

Viewing a Support Ticket

After a support ticket is generated, it is displayed in the support ticket viewer. This viewer is built into the L&TT program. Information is displayed in a standard tree-view format. Click the "+" and "–" signs to expand and collapse sections of the support ticket. Use the standard navigation keys (**Home**, **End**, **Page Up**, **Page Down**, and the arrow keys) and the Windows scroll bars to navigate through the document.

Using the Tabular View

Items in the support ticket that are preceded with the Tabular View icon ( ) have additional information that can be displayed in Tabular View. To view the additional information in Tabular View, click the icon. One of the following occurs:

- If only one view is available for the item you clicked, then a Tabular View window immediately opens.
- If more than one view is available for the item you clicked, a shortcut menu is displayed. Select the desired option and click **OK**. The Tabular View window opens.

Figure 15 shows an example of a typical Tabular View window.

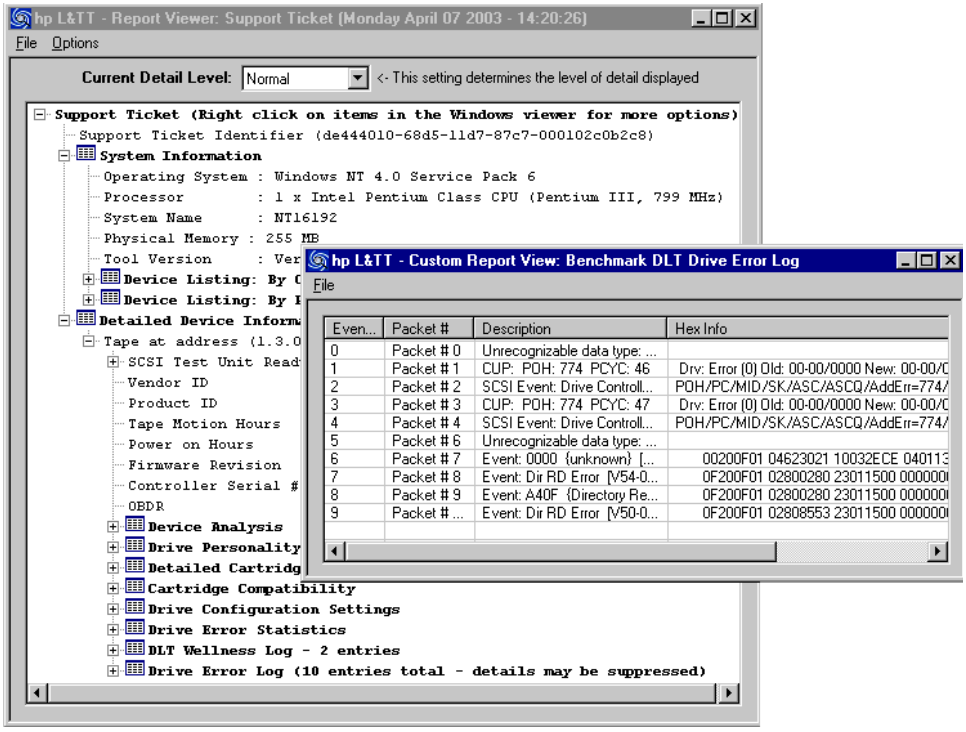
hp L&TT - Report Viewer: Support Ticket (Monday April 07 2003 - 14:20:26)
File Options
Current Detail Level: Normal <- This setting determines the level of detail displayed
Support Ticket (Right click on items in the Windows viewer for more options)
Support Ticket Identifier (de444010-68d5-11d7-87c7-000102c0b2c8)
System Information
Operating System : Windows NT 4.0 Service Pack 6
Processor : 1 x Intel Pentium Class CPU (Pentium III, 799 MHz)
System Name : NT16192
Physical Memory : 255 MB
Tool Version : Ver
Device Listing: By C
Device Listing: By I
Detailed Device Informa
Tape at address (1.3.0
SCSI Test Unit Read
Vendor ID
Product ID
Tape Motion Hours
Power on Hours
Firmware Revision
Controller Serial #
OBDR
Device Analysis
Drive Personality
Detailed Cartridg
Cartridge Compatibility
Drive Configuration Settings
Drive Error Statistics
DLT Wellness Log - 2 entries
Drive Error Log (10 entries total - details may be suppressed)
hp L&TT - Custom Report View: Benchmark DLT Drive Error Log
File
Even... Packet # Description Hex Info
0 Packet # 0 Unrecognizable data type: ...
1 Packet # 1 CUP: POH: 774 PCYC: 46 Drv: Error (0) Old: 00-00/0000 New: 00-00/0
2 Packet # 2 SCSI Event: Drive Controll... POH/PC/MID/SK/ASC/ASCQ/AddErr=774/
3 Packet # 3 CUP: POH: 774 PCYC: 47 Drv: Error (0) Old: 00-00/0000 New: 00-00/0
4 Packet # 4 SCSI Event: Drive Controll... POH/PC/MID/SK/ASC/ASCQ/AddErr=774/
5 Packet # 6 Unrecognizable data type: ...
6 Packet # 7 Event: 0000 {unknown} [... 00200F01 04623021 10032ECE 040113
7 Packet # 8 Event: Dir RD Error [V54-0... 0F200F01 02800280 23011500 000000
8 Packet # 9 Event: A40F {Directory Re... 0F200F01 02800280 23011500 000000
9 Packet # ... Event: Dir RD Error [V50-0... 0F200F01 02808553 23011500 000000

Figure 15: Tabular View window

The Tabular View window supports the following operations:

- **Sorting columns**—Click a column header to sort by that column. Repeatedly clicking the same column header toggles between ascending and descending sort order.
- **Filtering columns**—Right-click a column header and choose **Filter** from the context menu to filter a column. A dialog box prompts you for the filter value. Enter a value and click **Filter**. To remove the filter, right-click the column header again and choose **Clear Filter** from the context menu.
- **Exporting data**—The Tabular View data can be exported as a CSV (comma separated value) file. A CSV file is a text file in which values are separated by a comma (or other specified separator). Data in a CSV file can be imported by a variety of popular spreadsheet and database applications such as Microsoft Excel and Access.

To export Tabular View data to a CSV file, choose **Export** from the **File** menu. Enter the path and filename for the CSV file in the dialog box and click **Save**.

Setting the Detail Level

The support ticket can display information in several different levels of detail, depending on the setting displayed in the **Current Detail Level** dropdown box. The following detail level settings are available:

- Highlights only
- Normal
- More detail
- Everything (the highest level the end user can view)
- Factory only (requires a factory password)

Note: The "factory only" detail level is only visible after the factory password has been entered into the software, either from the menu function in the report viewer or in the menu item within the main application. If the factory password is entered via the main application, it is saved in the registry and will not require subsequent re-entry.

Figure 16 shows an example of the information contained in a report with the detail level set to "Normal."

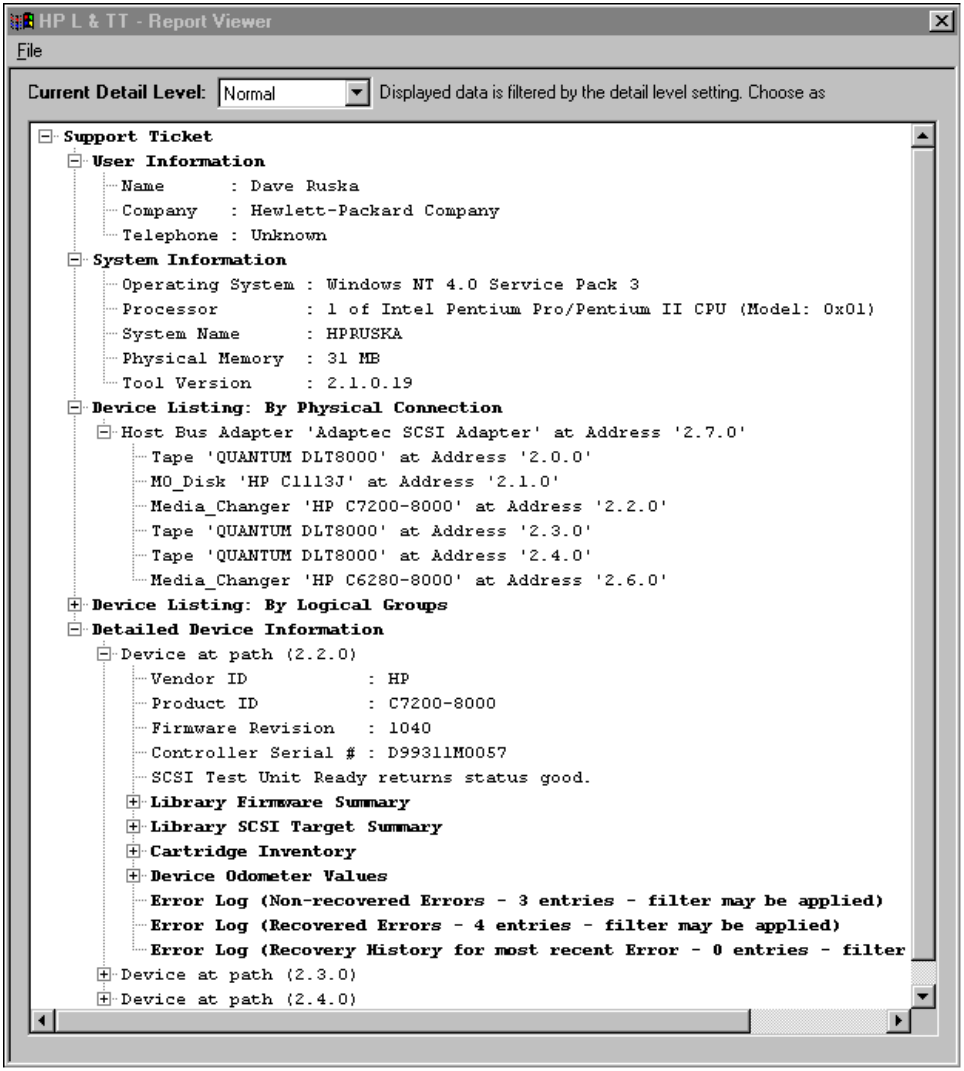
HP L & TT - Report Viewer
File
Current Detail Level: Normal
Displayed data is filtered by the detail level setting. Choose as
Support Ticket
User Information
Name : Dave Ruska
Company : Hewlett-Packard Company
Telephone : Unknown
System Information
Operating System : Windows NT 4.0 Service Pack 3
Processor : 1 of Intel Pentium Pro/Pentium II CPU (Model: 0x01)
System Name : HPRUSKA
Physical Memory : 31 MB
Tool Version : 2.1.0.19
Device Listing: By Physical Connection
Host Bus Adapter 'Adaptec SCSI Adapter' at Address '2.7.0'
Tape 'QUANTUM DLT8000' at Address '2.0.0'
MO_Disk 'HP C1113J' at Address '2.1.0'
Media_Changer 'HP C7200-8000' at Address '2.2.0'
Tape 'QUANTUM DLT8000' at Address '2.3.0'
Tape 'QUANTUM DLT8000' at Address '2.4.0'
Media_Changer 'HP C6280-8000' at Address '2.6.0'
Device Listing: By Logical Groups
Detailed Device Information
Device at path (2.2.0)
Vendor ID : HP
Product ID : C7200-8000
Firmware Revision : 1040
Controller Serial # : D9931IM0057
SCSI Test Unit Ready returns status good.
Library Firmware Summary
Library SCSI Target Summary
Cartridge Inventory
Device Odometer Values
Error Log (Non-recovered Errors - 3 entries - filter may be applied)
Error Log (Recovered Errors - 4 entries - filter may be applied)
Error Log (Recovery History for most recent Error - 0 entries - filter
Device at path (2.3.0)
Device at path (2.4.0)

Figure 16: Example support ticket with normal detail (Windows version)

Sending a Support Ticket by E-mail

From the **Support** screen, click **Send Support Ticket by E-mail** to generate the support ticket and immediately send it via e-mail to an HP support center (or other destination). When you click **Send Support Ticket by E-mail,** the **E-mail Support Ticket** dialog box is displayed.

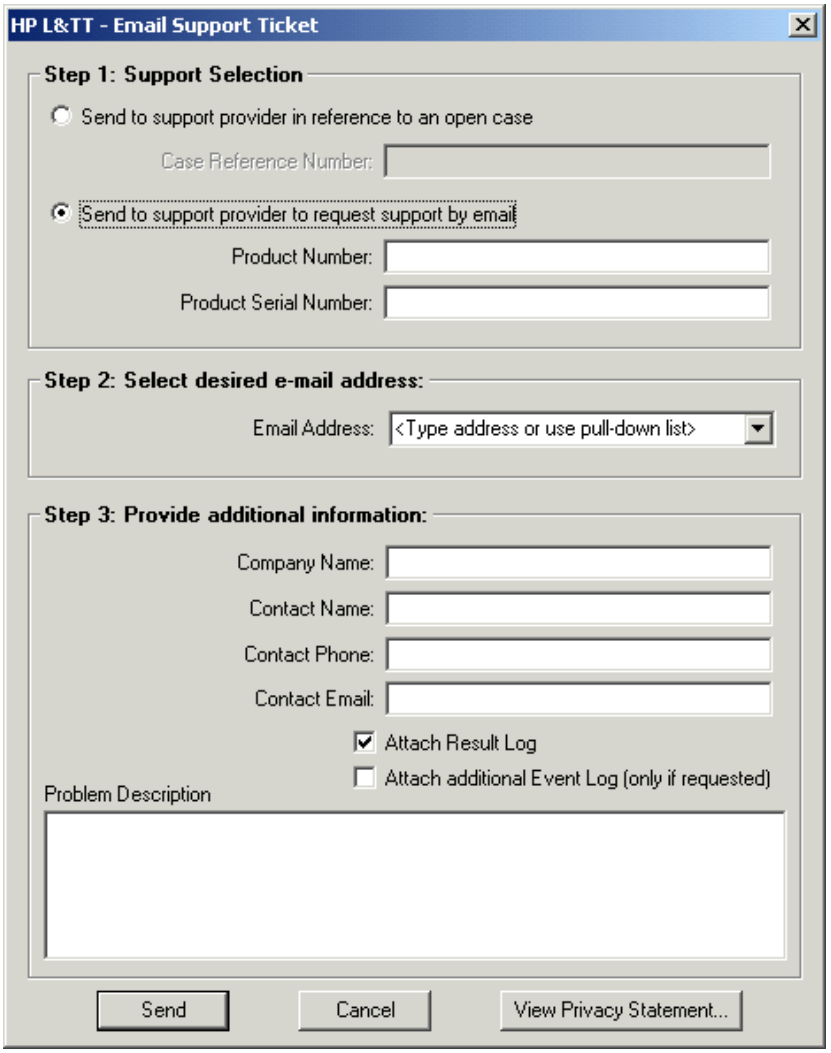

Figure 17: E-mail Support Ticket dialog box

Before L&TT can email a support ticket, you must either have a MAPI-compliant e-mail program (such as Microsoft Outlook or Outlook Express), or you must set up an email account through the Windows Control Panel or Internet Explorer. For more information about setting up an e-mail account, see How do I configure e-mail to send support tickets?.

The **E-mail Support Ticket** dialog box is divided into three steps:

1. In **Step 1**, indicate whether this is a new support request or an existing case.
   - If this is a new support request, select the **Send to support provider to request support by e-mail** option (this option is the default). Enter the product number and product serial number in the appropriate fields.
   - If this is an ongoing support case, select the **Send to support provider in reference to an open case** option and enter the case reference number in the appropriate field.
2. In **Step 2**, enter the destination e-mail address. Use the dropdown box to select from a list of HP support providers, or enter the e-mail address manually.
3. In **Step 3**, specify the following additional information:
   - **Contact information**—Enter your company name, contact name, contact phone, and contact e-mail address.
   - **Attach Result Log**—Select this option to attach the support ticket to the e-mail for analysis by HP service personnel.
   - **Attach additional Event Log (only if requested)**—Select this option if you have been requested by HP service personnel to send the event log. For more information about using the event log, see Using the Event Log.
   - **Problem description**—Enter a detailed description of the problem you are having.

When you have completed the form, click **Send**.

CSI Generating and Viewing a Support Ticket

To generate and view a support ticket in the CSI environment:

1. From the **Main** screen, select the device for which to create a support ticket. The **Device Information** screen is displayed.
2. Enter the `support` command to access the **Support** screen.
3. From the **Support** screen, do one of the following:
   - Enter the `view` command to view the support ticket.
   - Enter the `save` <*filename*> command to save the support ticket with the specified filename. The support ticket can be viewed later using the `load` command from the **Main** screen.

When viewing the support ticket, use **Ctrl+U** and **Ctrl +D** to scroll up and down through the results. You can also use the `find` and `page` commands to quickly locate information.

Common Information Reported for All Products

Note: For standalone devices (such as DDS drives), HP recommends that you generate the support ticket when the drive still contains the media with which the drive may have failed. This allows error rate and other information relevant to that cartridge to be examined. When media is removed, many products automatically clear this information. However, for most SureStore tape libraries it is better to have the drives empty; this forces the library drive/media log to be updated.

The following information is included in the support ticket regardless of what products are being analyzed:

- **System information** provides basic host system information such as operating system, processor type, system name, physical memory size, and the current version of L&TT being used. This information also includes a snapshot of the SCSI bus configuration determined by the I/O scan, showing connected devices listed physically and logically.
- **L&TT history** provides a brief history of the L&TT functions the user has accessed such as whether ASPI was installed, how many times L&TT has been run, and which functions have been used.

Device-Specific Information Reported

The support ticket also contains device-specific information that varies by device family.

Using the Event Log

L&TT can generate a detailed event log that captures all L&TT diagnostic interaction with the product, all SCSI commands sent and received by the program, and any software interactions or issues. By default, the event log is not accessible until the factory password has been entered. The information it contains is intended for use by L&TT programmers as a tool for debugging software issues within the program itself.

If you experience a software problem with L&TT:

1. Run L&TT and select **Preferences** from the **Options** menu.
2. Check the **Add I/O history to event log** option and click **OK**.
3. Exit L&TT and then restart it.
4. Replicate the problem encountered.
5. Using Windows Explorer, navigate to the `logs` directory in the L&TT installation directory. Locate the *Eventlog.ltt* file.
6. Attach the *Eventlog.ltt* file to an e-mail and send it to the L&TT team for diagnosis.
7. Return to L&TT and select **Preferences** from the **Options** menu.
8. Uncheck the **Add I/O history to event log** option and click **OK**. This option should not be left enabled because it can potentially use hundreds of megabytes of disk space.

In the log directory you may also see other event log entries such as *EventLog_backup1.ltt*, *EventLog_backup2.ltt*, *EventLog_backup3.ltt*, and so on. The versions of the event log are numbered in historical order.

Additional Functionality

7

This chapter describes additional features of the program that are not covered elsewhere in this guide.

- Setting Software Preferences
- Using the Internet Update Functionality
- Using Passwords
- Using the Front Panel Function
- Using the Move Media Function
- Performing Manual Product Identification

Setting Software Preferences

L&TT has many user-definable preferences that control various elements of the program. To access the L&TT preferences:

GUI

To set the preferences in the Windows version of L&TT:

Select **Preferences** from the **Options** menu. The preferences dialog is displayed as shown in Figure 18.

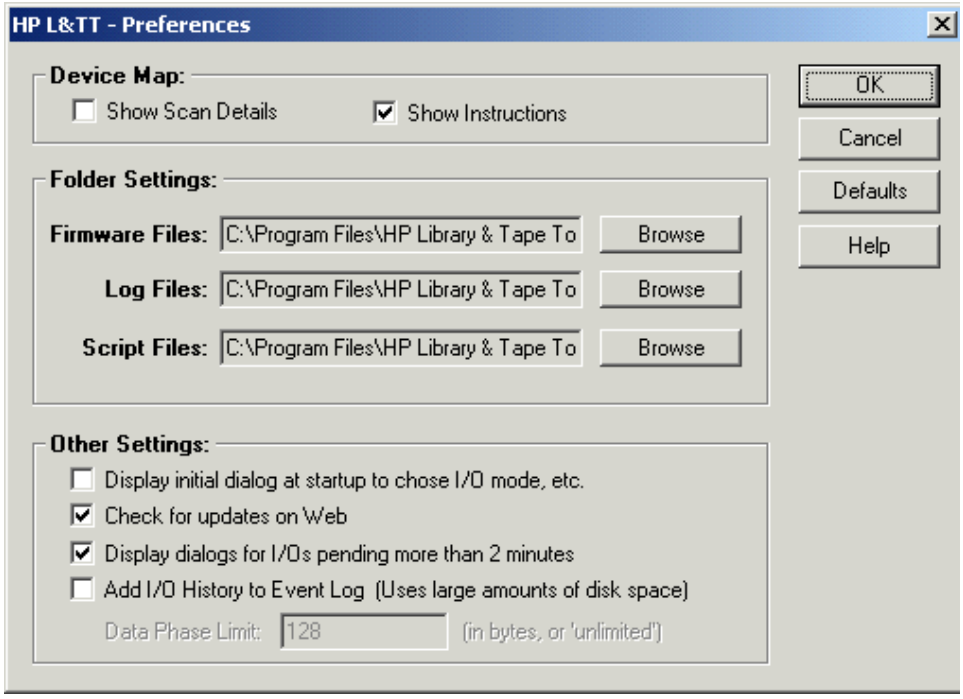

Figure 18: L&TT Preferences dialog box (default settings shown)

CSI

To set the preferences in the CSI version of L&TT:

From the **Main** screen, use the `preferences` command to display the **Preferences** screen.

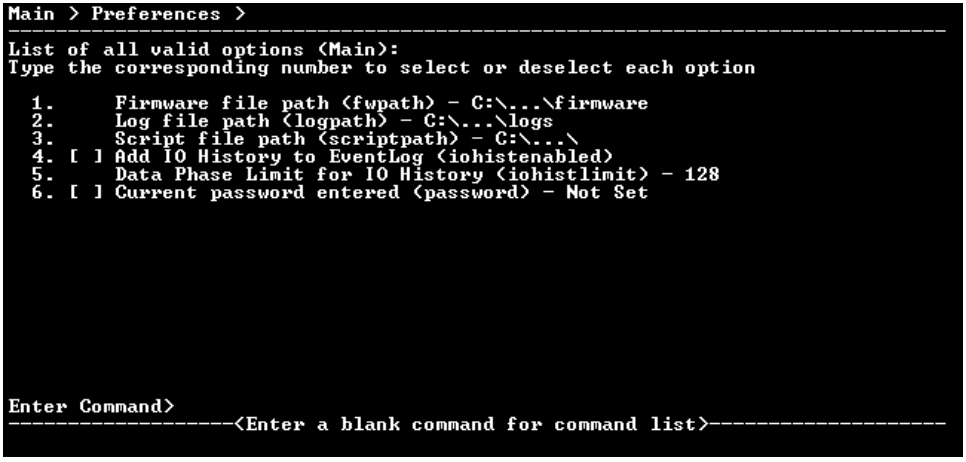

Figure 19: L&TT preferences dialog box (CSI version)

Available Options

The following list describes the available options. Some options are not available with CSI versions of L&TT.

- **Show Scan Details (Windows only)**—Enabling this option causes L&TT to show the SCSI bus scanning process in the **Device List** screen when the program is first started. This option is disabled by default.
- **Show Instructions (Windows only)**—Enabling this option causes L&TT to display instructions in the **Device List** screen. These instructions provide information corresponding to the function displayed in the **Main** screen. More experienced users may want to disable this option.
- **Firmware File Path**—This is the location where L&TT stores and accesses firmware files on your local system. When using the "Get Firmware From Web" feature, firmware files are automatically downloaded to this directory.
- **Log File Path**—This is the location where L&TT stores and accesses log files on your local system. The logs that are stored here are the support and event logs.

- **Script File Path**—This is the location where L&TT stores and accesses device analysis rules files. This is also the default location for SCSI scripts.

Note: For all of the previous three options, the default location of the directory is the L&TT Installation directory.

- **Display initial dialog at startup to choose I/O mode etc. (Windows only)**—Enabling this option causes the L&TT splash screen to be displayed when the program is started. From the splash screen, you can select the I/O mode and other options.
- **Check for updates on the Web (Windows only)**—When this option is enabled, L&TT uses an available Internet connection to look for product updates such as firmware upgrades, new device analysis rules, and new versions of L&TT. The software performs this check once every 24 hours. This functionality is only available if you have an Internet connection. For more information, see the "Internet Update Functionality" section later in this chapter.
- **Display dialogs for I/O pending more than 2 minutes (Windows only)**—When this option is enabled, L&TT displays a status update dialog box during long SCSI operations.
- **Add I/O history to Event Log**—Enabling this option causes L&TT to log all SCSI commands that are sent or received into a log file.This option requires a large amount of disk space and should only be used when requested by L&TT development personnel to aid in the debugging of a potential issue with L&TT. For more information, see Using the Event Log.
- **Data Phase Limit for I/O History**—When the **Add I/O History to Event Log** option is enabled, this option limits the amount of data recorded to the log file for each SCSI command to the number of bytes specified. The default is 128 bytes. To specify a data phase limit, enter any positive number in this field. If you do not want to specify a limit, enter `unlimited`.
- **Current password entered**—This option lets you enter the factory password. The currently entered password is displayed to the right of the option. If no password has been entered, `Not Set` is displayed.

GUI Using the Internet Update Functionality

The Windows version of L&TT can automatically notify the user of the following conditions each time the program is started:

- A new version of L&TT has been released
- A new version of firmware is available for a connected storage device
- A new version of device analysis rules is available for a connected storage device

This notification only occurs if the user has the **Check for updates on web** option enabled in the preferences dialog (this option is enabled by default).

If the **Check for updates on web** option is not enabled, select **Get Files from Web** from the **File** menu to manually check for and download updates.

Note: L&TT will only check for updates on the Web once in a 24-hour period.

Using Passwords

A number of tool features are available only when enabled with a password. The password is intended to prevent inexperienced users from accessing functionality that may be particularly harmful to their system if used inproperly.

Setting Passwords

To set the password in the Windows version of L&TT:

1. Select **Enable Factory Overrides** from the **Options** menu. The **Factory Password** dialog box is displayed.
2. Enter the password and click **OK**. Assuming the password is valid, you are now able to access the password-protected functions of L&TT.

To set the password in the CSI version of L&TT:

1. From the **Main** screen, enter the `preferences` command. The **Preferences** screen is displayed.
2. Enter the number that corresponds to the password option. L&TT prompts you for the current password.
3. Enter the password. If the password is valid, then L&TT returns you to the **Preferences** screen. You are now able to access the password-protected functions of L&TT.

GUI Using the Front Panel Function

L&TT provides remote control of the front panel of selected library devices. L&TT reads the contents of the front panel at regular intervals and displays the contents of the L&TT window either in graphic or text form. In addition, L&TT displays a representation of the library's front panel buttons. Clicking a button simulates the user pressing the corresponding button on the library's front panel.

To access this functionality, select the library in the device list and click **Frontpanel** on the main toolbar. The **Front Panel** screen is displayed as shown in Figure 20.

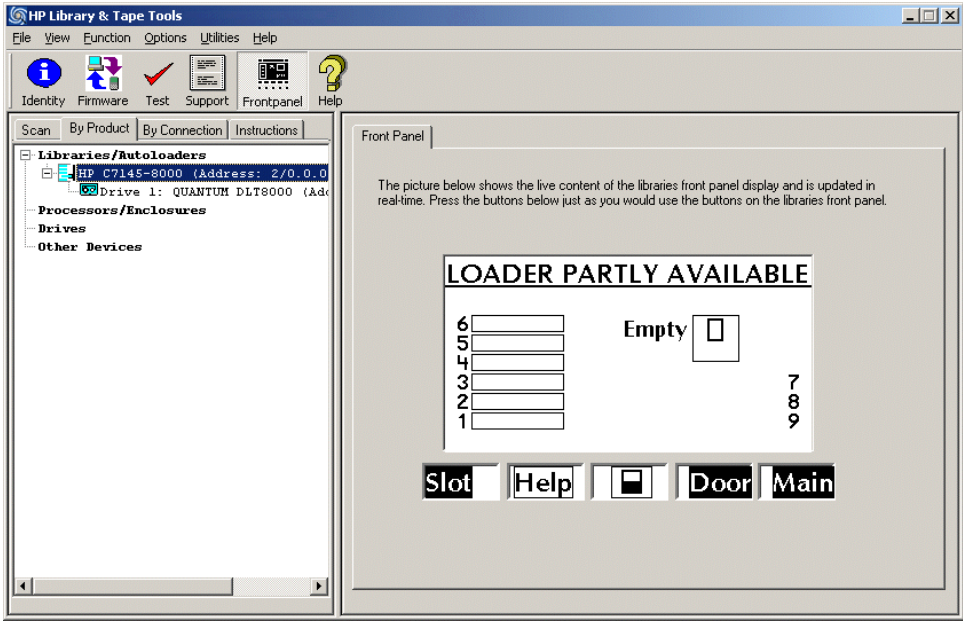

Figure 20: Front panel screen

Using the Move Media Function

Most supported libraries and autoloaders support a set of commands for moving media from one location to another within the device. Whenever possible, L&TT takes advantage of this functionality to provide a convenient way to move media within a library or autoloader. This functionality is supported in both the GUI and CSI versions of L&TT.

GUI

With the Windows version of L&TT, the Move Media functionality is incorporated into the **Front Panel** screen. To access this functionality:

1. Select a supported library or autoloader from the device list and click **Frontpanel** on the main toolbar (the **Frontpanel** button is grayed out if both the Move Media and Front Panel functions are not supported for the selected device).
2. On the **Front Panel** screen, click the **Move Media** tab (this tab is not available if the Move Media function is not supported for the selected device). The **Move Media** screen is displayed.

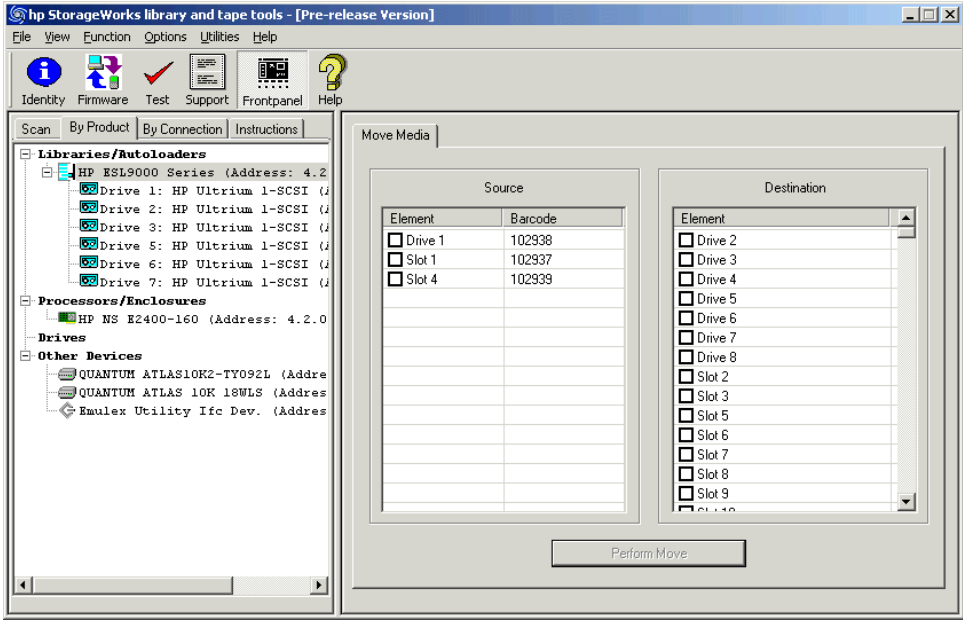

Figure 21: Move Media screen

The **Move Media** screen is divided into two sections showing all available source and destination drives, slots, and mailslots. To move media from one location to another, selected the desired source and destination locations and click **Perform Move**.

Note: Only one item can be moved at a time, so it is not possible to select multiple source or destination locations. The **Perform Move** button is grayed out until a valid source and destination have been selected.

CSI

With the CSI version of L&TT, from the **Device Information** screen for a supported library or autoloader, use the `movemedia` command to access the **Move Media** screen. This screen is identical to the Cartridge Inventory screen accessed with the `inventory` command with the exception of the screen name shown in the top line. Use the standard keyboard commands (**Ctrl+U**, **Ctrl+D**) to scroll through the list. To perform the move, use the `move` command.

```
move <source> <destination>
```

The values used for <*source*> and <*destination*> are a combination of the letter `s` for slot, `d` for drive, or `m` for mailslot, and the number of the device. Two examples are given to illustrate this.

- Example 1

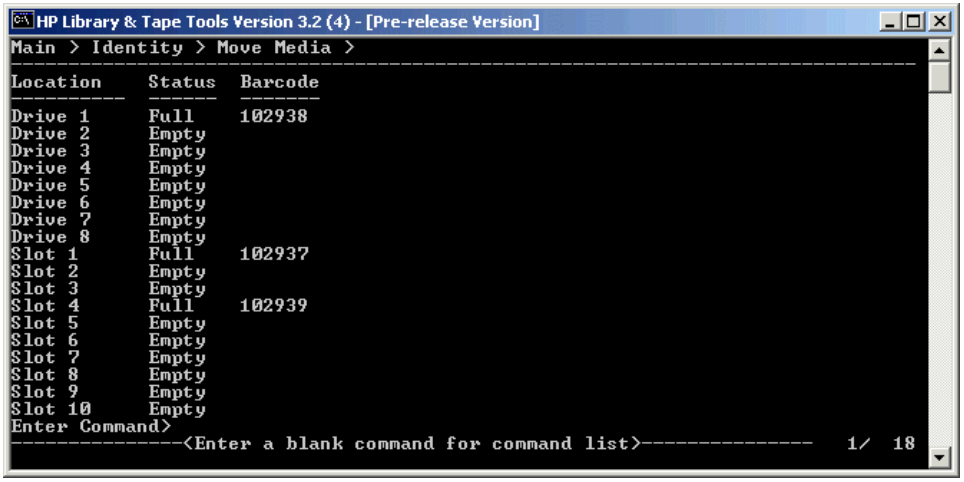

Figure 22: Move Media screen - example 1a

In the example shown in Figure 22, to move media from Slot 4 to Slot 3, enter the following command:

```
move s4 s3
```

The following screen results:

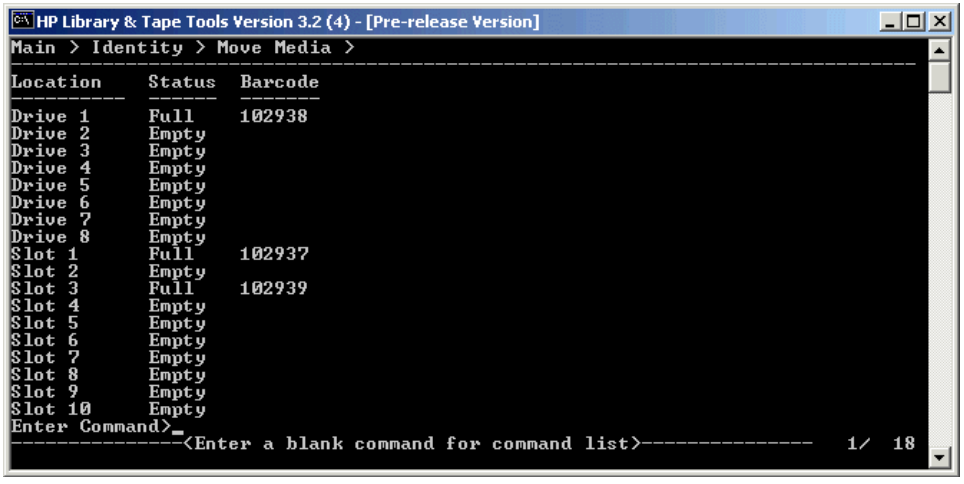

Figure 23: Move Media screen - example 1b

- Example 2

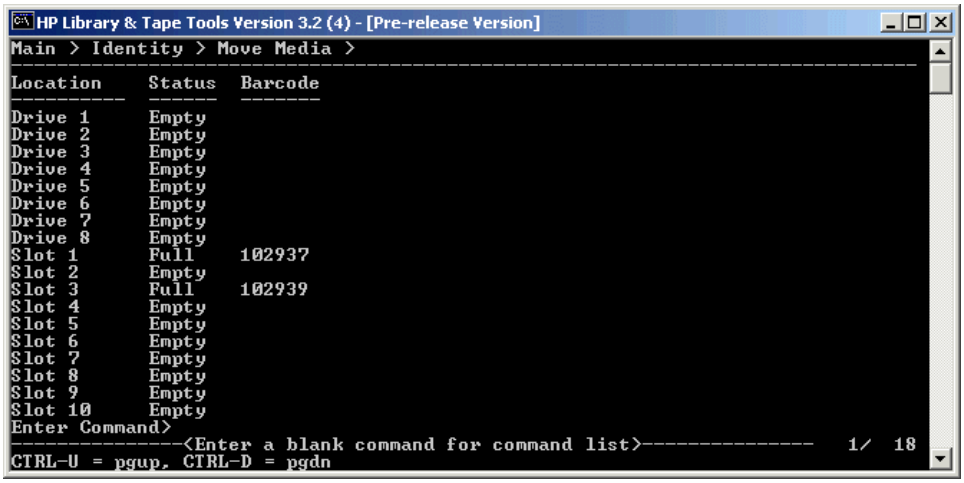

Figure 24: Move Media screen - example 2a

In the example shown in Figure 24, to move media from Drive 1 to Mailslot 3, enter the following command:

```
move d1 m3
```

The following screen results:

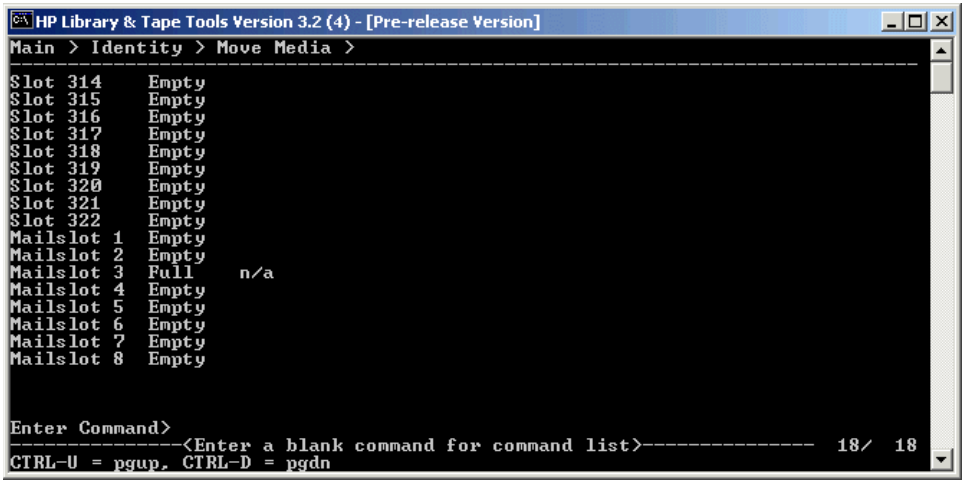

Figure 25: Move Media screen - example 2b

Possible Move Media Error Situations

The following errors may be encountered when attempting to move media through L&TT:

Note: These errors are less common with the Windows version of L&TT because the user interface reduces the number of possible error situations.

1. The source is empty.
2. The destination is full.
3. The picker is full with some other media.
4. The source and destination are the same.
5. Invalid arguments were provided (for example, the slot number is too high or no mail slots on the system).
6. Slot to slot is not supported with this device (you must move slot to drive or drive to slot).
7. The command was acceptable, but there was a SCSI error performing the move. L&TT provides the SCSI error message along with the sense data.

Performing Manual Product Identification

This feature (which requires a password) allows an arbitrary device to be mapped as a specific device family within L&TT. This feature is most commonly used when the product ID (SCSI inquiry) string does not match the string expected by L&TT. The string may have been changed or corrupted, or the product is operating in “boot code” mode.

To manually identify a device:

1. Select a product in the device list.
2. Select **Manual Product Identification** from the **Function** menu.
3. Choose the product family that best matches the selected device.

Note: For L&TT versions prior to 2.7 SR2a, manual product identification (previously called override mapping) was performed by right-clicking the device in the device list and choosing the appropriate product family.

Select the product family that best matches the device. The choices are:

- DDS Drive
- DDS Autoloader
- Ultrium Drive
- DLT/SDLT/DLT1 Drive
- DLT/Ultrium Library
- 1/8 DLT Autoloader
- 1/8 Ultrium Autoloader
- AIT Drive
- AIT Library
- AIT Autoloader
- ESL Library
- MSL Library
- TL89x Library
- MO Drive
- MO Library

- STK 9840 Drive
- STK Library
- SCSI-FC Bridge
- 4Runner Bridge
- Interface Manager

When manual product identification is enabled, L&TT automatically operates in a restricted mode. In this mode, the firmware update options are pre-selected to enable selection of firmware for any product ID and also set the "update product ID" option. To update the product ID, select the proper firmware file and click the **Start Update** button.

Advanced Installation Topics

8

GUI Windows Installation Topics

Installation Types

There are currently two main Library & Tape Tools InstallShield bundles:

1. **L&TT Installer, English, End-User Type** (only catalogs for current version)—This is an end-user bundle for customers that has been optimized for size, so downloads are quick. This version can be found on the HP customer websites and allows viewing of support tickets from the same tool version only.
2. **L&TT Installer, English, Support Type** (catalogs for current and all legacy versions)—This is an internal HP support personnel bundle. This version contains the catalogs (files that contain all the strings used in the application) for the current and all previously released versions (back to 2.5). Support personnel can read support tickets generated by the current or any previous version of L&TT.

Other Changes to the System

The L&TT installation adds the following keys to the Windows registry:

```
HKEY_LOCAL_MACHINE\Software\Hewlett-Packard\HP Library & Tape Tools
```

```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Uninstall
```

Reboot Criteria

Under some circumstances, the installation process requires a reboot of the system. A reboot is only required in the following situations:

1. If your system requires ASPI or an upgrade to your currently installed version, you will need to reboot.

   On Windows NT and 2000, ASPI is not installed as part of the operating system, so if a reboot is unacceptable, do not select the check box for this option in the installation process. If you choose not to install ASPI, then you must use the Miniport driver (Miniport I/O mode) to scan for devices. However, problems may arise when using the Miniport I/O mode with devices that use non-standard OS drivers, or are "claimed" by other applications or the OS. When using the Miniport I/O mode when a device is claimed, you may have to shut down your backup/storage application services to make the device accessible to L&TT. Alternatively, using the ASPI I/O mode may make the device accessible without requiring any further action.

2. If the installation program detects an older version of the *comctl32.dll* installed on your system, then it will automatically upgrade the this file to the current revision level, and a reboot is required. This file is the Windows Common Control library, and it is a required component of Windows. If you are running Internet Explorer 4 (with Service Pack 2) or a later version, then you already have the correct version of the Windows Common Control library.

GUI CSI Files Installed on the System

During installation, L&TT files are installed in the following directories:

Table 2: L&TT installation directory locations

Operating System	Directory Location
HP-UX, Linux, and Tru64	`/opt/ltt` (main executable is *hp_ltt*)
Netware	`SYS:System\hpltt` (main executable is *hp_ltt.nlm*)
Windows	`C:\Program Files\HP Library & Tape Tools` (main executable is *hp_ltt.exe*)

Several sub-directories are created under the main installation directory. These sub-directories are as follows:

- **Catalogs**—This is the location where the message strings for the software are kept. The end-user version has only the catalogs for the latest version of code. With the support personnel installation, catalogs are included for previous versions (back to version 2.5), so support tickets generated by these versions can be viewed.
- **Firmware**—This is the default directory where firmware files are kept. When L&TT is first installed, this directory is usually empty (unless specific firmware images were bundled - such as the 2.7 SR2 release that includes firmware for DDS3 write recalibration). The name and location of the firmware directory can be changed from **Options >> Preferences**.
- **Logs**—This is the default directory where L&TT saves event logs and support tickets. This directory is also used to store any script-generated files such as baseline files, results files, and so on.
- **Misc**—This directory is used to hold test data files and L&TT history for the specific devices on the system. These files are used by L&TT itself and not intended for direct viewing.
- **Scripts**—This directory contains all the device analysis rules, add-on tests, and SCSI script files. For more information, see Chapter 5, “Tests and Utility Functions.”

With Windows installations, in addition to the files installed in the main installation directory, some files are installed outside of the main installation directory. If ASPI installation is selected or required, the following files are added/updated (assuming that the Windows system directory is `C:\WINNT`):

- *C:\WINNT\System\winaspi.dll*
- *C:\WINNT\System32\wnaspi32.dll*
- *C:\WINNT\System32\drivers\aspi32.sys*

If the *comctl32.dll* (Windows Common Control library) needs to be updated (see the "Reboot Criteria" section below) the following file is updated (assuming that the Windows system directory is `C:\WINNT`):

C:\WINNT\System\winaspi.dll

CSI Other Changes to the System

The same information that the Windows version of L&TT stores in the Windows registry is stored as a text file for the Unix versions. This text file is located in the following directory:

- HPUX & Tru64:

  `/.lttreg`

- Linux:

  `/root/.lttreg`

Frequently Asked Questions

9

This chapter addresses several of the most common questions regarding L&TT software.

GUI Windows Environment

How do I run L&TT from a CD-ROM?

It is possible to create a version of L&TT that can run directly from a CD-ROM without the need for installation or alteration of registry settings. This feature is most useful on Windows NT and Windows 2000. On other Windows platforms, it requires WINASPI to be installed.

To create a version of L&TT that can run from a CD-ROM drive:

1. Fully install L&TT to your computer. If desired, also install any desired firmware files into the firmware subdirectory.
2. Remove the logs directory from the L&TT install directory.
3. Write the contents of the L&TT install directory to the root directory of the CD-ROM and close the CD-ROM.
4. Put this CD-ROM into any Windows system and run *HP_LTT.exe* from the root directory.

How do I shut down the application in the taskbar?

Under certain circumstances, L&TT may not completely shut down. To completely terminate the application:

1. Press **Ctrl+Alt+Del**.
2. Select **Task Manager.**
3. Click the **Processes** tab.
4. Select the process named *HP_LTT.exe* and click **End Process**.

Why can't I uninstall L&TT or install a new version?

If you have problems uninstalling L&TT or cannot install a new version after installing or uninstalling a previous version:

Caution: The following procedure involves editing the Windows registry. HP recommends backing up the registry before attempting this procedure.

1. Use Windows Explorer to delete the entire Library & Tape Tools directory from the original location (the default location is *c:\program files*).
2. Do the following to start the registry editor:
   a. Click **Start**.
   b. Click **Run**.
   c. In the **Open** text box, enter `regedit` or `regedit32`, depending on which OS you are using.
3. In the registry editor, navigate to the following folder:
   HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Uninstall
4. Locate the following folder:
   {DEAEEE8A-2478-4A1E-AF90-1A2022987EF1}

Note: The actual name of the subfolder in Step 4 may differ, depending on the current machine and the current version of L&TT being used.

5. Right-click the folder and click **Delete** from the popup menu to delete the folder.
6. Close the registry editor.

How do I configure e-mail to send support tickets?

To successfully send a support ticket via e-mail directly from L&TT, you must have a MAPI-compliant e-mail client set up for outgoing e-mail. Even if e-mail software (such as Outlook or Outlook Express) is not installed, you can configure a simple e-mail account using the Internet Connection Wizard that comes with Internet Explorer. To access the Internet Connection Wizard:

1. Launch Internet Explorer. If this is the first time to launch Internet Explorer on this machine, the Internet Connection Wizard is displayed automatically. Follow the instructions until you reach the step that asks whether an Internet e-mail account should be set up. Answer **Yes** and skip to Step 5. If this is not the first time to launch Internet Explorer on this machine, proceed with Step 2.
2. Select **Internet Options** from the **Tools** menu.
3. Select the **Connections** tab.
4. Click **Setup** at the top of the dialog to start the Internet Connection Wizard.
5. Enter a display name (this is the "From" name in the e-mail) and click **Next**.
6. Enter the return e-mail address and click **Next**. If there are no e-mail accounts on this system that will be monitored, use your regular e-mail address at which you can be contacted by the recipient of the support ticket.
7. Enter **bogus** as the address for the incoming mail server.
8. In the SMTP mail server field, enter the address of any SMTP mail server within the firewall of your organization that accepts SMTP send requests and click **Next**. If you do not know which address to use, contact your local system administator or check the mail account settings on your regular e-mail account.
9. If your SMTP server requires a login to send e-mail (most sites only require a login for incoming mail), you must provide proper account information. Otherwise, you can enter **bogus** in both fields. Click **Next**.

Your e-mail is now configured for outgoing mail delivery.

Does L&TT use any system resources in the background?

L&TT is an application, not a service. No part of the application uses any system resources unless the application is manually launched by the user.

CSI CSI Environment

How do I set the password?

With a few exceptions, you may at any time enter the `options` command to display the **Options** dialog. The password may be set from this dialog.

Notable exclusions:

- You may not enter the **Options** dialog when you are already in the **Options** dialog.
- You may not enter the **Options** dialog when you are past the first screen in either the **Firmware** dialog or the **Test** dialog.

For instructions on setting the password, see Setting Passwords.

Why does my display not show any text or only a single line of text on my HP-UX system?

Display problems can happen for two reasons:

- If TERM, COLS, and ROWS are set incorrectly there can be problems. Execute the following command:

  ```
  /opt/ltt/hp_ltt -o displaytest
  ```

  Follow the prompts to let L&TT analyze your settings.
- If the patch level of the host machine is too low, curses may not function properly (10.20 systems only). Be sure to apply patch B6378DA or higher.

Why doesn't L&TT for HP-UX "see" some of my devices?

Several things can prevent L&TT from seeing a device in HP-UX:

- If a device shows up in an I/O scan as "NO_HW," this means that the device was previously visible to the system, but currently is not. This could be because the device was unplugged from the SCSI bus or powered down.
- L&TT does not support the NIO bus type. If your system has an HSC or PCI bus, connect your device to that bus. If your system does not have an HSC or PCI bus, unfortunately, L&TT will not work for you.
- The device is connected to an unsupported HBA. Connect the device to an HBA with a supported driver. L&TT supports HBAs with the following drivers:
  - c720
  - c8xx
  - fcpdev
  - fcpmux
- If a device shows up in the I/O scan as "unclaimed," you may have to install or enable the tape driver kernel module using the SAM tool.

Why doesn't L&TT for Tru64 "see" some of my devices?

Whenever you connect or remove a device, you must reconfigure the CAM and hardware manager layers. Furthermore, Tru64 does not support hot swapping of SCSI devices. To reconfigure the CAM and hardware manager layers:

1. Close L&TT.
2. Use the following command to check for stale devices:

   ```
   /sbin/hwmgr show scsi -full | grep stale
   ```

3. Remove any stale devices. If you are not sure whether a device is stale or not, remove it anyway. Devices can be rediscovered later. Use the following command to remove a device:

   ```
   /sbin/hwmgr -delete scsi -did <SCSI ID>
   ```

4. Rescan the SCSI bus.

   ```
   /sbin/hwmgr scan scsi
   ```

5. Rescan the CAM layer.

   ```
   /sbin/scu scan edt
   ```

6. Run the following commands to verify the SCSI devices:

   ```
   /sbin/hwmgr show scsi
   /sbin/scu show edt
   ```

7. Restart L&TT.

Why doesn't L&TT for Linux "see" some of my devices?

To detect a surrogate SCSI device, you must configure the *modules.conf* file for the new device you have connected. After modifying this file, reboot the computer so that the new device is recognized by the *scsi/sg* layer. Linux does not support hot swapping of SCSI devices. To reconfigure the *modules.conf* file:

1. Login as root.
2. Edit the following file:

   ```
   vi /etc/modules.conf
   ```

3. Add the following line as appropriate:

   ```
   add options scsi_mod max_scsi_luns=128
   ```

4. Reboot the computer.

How do I disconnect a SCSI device in Tru64?

1. Locate the SCSI device in hardware manager:

   ```
   /sbin/hwmgr -show scsi
   ```

2. Use the following command to delete the SCSI device.

   ```
   /sbin/hwmgr -del scsi -did <SCSI ID>
   ```

3. Disconnect the device.
4. Make sure that you have removed the corresponding SCSI cable from the HBA.

How do I connect/disconnect a SCSI device in Linux without rebooting?

- To add a new device, connect the device and run the following command:

  ```
  echo "scsi add-single-device <hostid> <busid> <targetid>
  <lunid>" >/proc/scsi/scsi
  ```

- To remove a device, run the following command and disconnect the device.

  ```
  echo "scsi remove-single-device <hostid> <busid> <targetid>
  <lunid>" >/proc/scsi/scsi
  ```

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